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Paper from Cornstalks

A Promising Fact in Spite of Dubious Beliefs

By EDWARD B. FRITZ

THERE has been considerable discussion all over the country as to the possibility of making paper from cornstalks. Pulp has been turned out, as is known, by the Cornstalk Products Company, at Danville, Illinois, and this has been made into paper on which books have been printed, and which has been used to turn out one or more issues of certain daily or weekly papers, particularly in the cornstalk section, which at least shows what can be done with the fiber from cornstalks in the manufacture of paper.

Naturally, a great amount of interest has been stirred up on this subject, more especially in the farming states, where all of the newspapers have had various items telling the farmer just what was coming in the shape of possible future sale for his cornstalks.

There has also been considerable discussion in the industry on the same subject. Some of these comments were favorable and some were not so favorable. The latter mainly points out that after a thorough investigation of some of these sheets that were supposed to have been made from cornstalk fiber, there was not 100 per cent of fiber from the cornstalks in these sheets, but something else mixed with it.

It would seem that this is not at all important, because in making other grades of paper—book, for instance, several different kinds of fiber are mixed, and one would not say that a sheet of book was made out of all sulphite pulp nor any other kind of pulp, so the mere fact that something else was mixed with cornstalk fiber to make the sheet that was called cornstalk fiber paper is not at all important. It would still be writing paper, book, or whatever you wished to call it.

No doubt one of the mistakes that has been made by the enthusiasts for the use of cornstalk fiber is that the statement has been made that this fiber is going to take the place of ground wood in the manufacture of newsprint. This is a rather ridiculous statement, for the very reason that cornstalk fiber is too good a fiber to go into the manufacture of newsprint, and all of this grade of fiber that can be secured for a goodly number of years to come can be used in other and better grades of paper.

The mill at Danville, and all other places where work is being done on this problem, have not solved all their problems, but they have shown that cornstalks will produce an exceptionally good fiber, and this being shown them, it is only necessary to work it out in order to bring out the best method of handling it, and the best way to get the largest possible revenue from it.

Nearly thirty years ago a number of persons, including the writer, were connected with an organization that was gotten together with the idea of making paper out of cornstalks. It is not necessary to state here just what became of this company, but it was proven at the time that cornstalk fiber would make an exceptionally good sheet of paper. A small plant was located on West Lake Street, in Chicago, where tests were made and a little machine was run for a number of months. Many prominent paper and machinery manufacturers in the western territory viewed these tests, and all of them pronounced the paper of exceptionally fine quality.

Cornstalk fiber may not have arrived as yet, but it is coming, and the time is not far distant.

For years, this industry has been searching for new fibers, something to take the place of wood or to at least lessen the destruction of the forest, and now that the cornstalk fiber has shown that it is possible for this annual crop to at least partially take the place of wood, the objectors rise up and say that it can't be done; therefore, some one goes ahead and does it.

It might be prophesied here that it will not be

very many years before the larger part of the raw materials for the manufacture of paper will come from the farms, in the shape of cornstalks, straw and other annual growths, and this will come in answer to the prayers of the paper industry for many years back for new fibers to take the place of our rapidly disappearing forests.

Many Products from Corn Field Waste

There is possibly nothing in this country that is now raised that has such tremendous possibilities for the good of humanity as there is in the utilization of the waste part in the corn field.

It is well known that rayon or artificial silk is now being made from cornstalk fiber. A plant is being built at the present time in Nebraska to manufacture wallboard from this same waste. Many things that have already been made from cornstalks are alpha cellulose, pyroxylin varnish, viocene, xylan, xylose, cellulose nitrate and cellulith.

Some thirty years ago there was a large organization in this country that furnished the pith of cornstalks to the Government for packing between the two plates of war vessels. It was stated that when the pith of the cornstalk was packed tightly in between these plates, should a shell go through them, the pith would act like a sponge and immediately close up, preventing an inflow of water.

It has been found that from the pith of the cornstalk can be manufactured dynamite, absorbent, face powder, gun cotton, insulating lining, linoleum, novelty pottery, papier-mâché, packing for war vessels, pipe covering and smokeless powder.

From the husks of cornstalks have already been made chair cushions, mattresses, oilcloth, upholstering, floor mats and rugs, and horse collars.

Along with these, the cobs of the corn have been turned into acetic acid, chloroform and rodoform, coloring, corn-cob pipes, wash boards, curing for concrete floors, diabetic food, dyes, furforal, fire lights, glue, hard rubber substitute, incense, menthanol, maple flavor, motor fuel, oxalic acid, pitch, plastic, punk, shampoo, resin, tar and sweeping compounds.

It is stated that from the cornstalk there has been produced a substitute for chickle used in the manufacture of chewing gum. Many boatloads of chickle have been imported into the United States every year, and this one item alone is important.

From the above, it may be seen that this story sounds considerably like the one that is told about the stock yards in Chicago, that it used to be said they used everything from the hog but the squeal, and recently they have been using that, so everything can be used from the cornstalk and not even a squeal is wasted.

There are still men in the industry who know that not so many years ago, as we count years, fine paper was made in this country from straw, but when wood became to be used, it was found that paper could be made cheaper from wood than straw, but methods and processes have so radically changed since those days that there seems no reason why straw should not be used today for the manufacture of high grades of paper, and aside from straw and cornstalks there are many other crops that could be grown profitably on the farm, and no doubt will be grown when it is shown that the farmers can get a profit out of them.

There is no doubt but that cornstalk fiber has arrived, and it only needs the proper development to find out the best methods of handling it to have this fiber to take its place along with wood and other fibers in the manufacture of paper.

How a Paper Mill Spends Its Days

News Print Service Bureau

OF THE 365 days in a year, a typical newsprint paper mill must operate at full speed for 81 days to produce enough paper to pay for labor. This includes all men from the bush to finished paper. In other words, 26 per cent of the year's activity is required to hire men for cutting and transporting the wood to the mill, preparing, grinding and cooking it and for operating the machinery and equipment which makes the pulp into paper.

The next 62 days all hands must sweat, wheels hum and pumps throb to make paper enough to buy the necessary wood for the year. The cost of wood in this case being stumpage fees and other expenses, other than labor, in getting the prepared wood into the mill.

Employees must have a few days for rest and recreation, so the plant is shut down 56 days for Sundays and holidays. The machinery and equipment are just simply idle during this time.

A paper mill cannot get along at all without steam and power so the whole organization is kept going at a top speed for 40 days in order to earn enough for steam and power to keep the wheels turning over and to cook pulp and dry paper.

The life of a plant and equipment is, of course, limited on account of wear and tear and obsolescence. The property must be insured against fire and other losses, and taxes, like the poor, are always with us. There is interest on bonds and other capital charges. To cover these fixed expenses requires 34 days hard work for the whole layout.

Administration, selling and shipping takes a pretty good block of the year's operation, 31 days' production being expenses.

It takes 15 days' operation to cover the expenses of miscellaneous materials, such as sulphur, limestone, coloring, etc.

A paper machine must be kept in expensive cloth-

ing for it to do a good job. This item together with wires requires the gross earnings of 10 days' operation.

Material for the ordinary everyday repairs to machinery and equipment absorbs the value of one week's (6 days) production.

By the simple processes of adding and subtracting we find that there are 31 days left for the mill to work for its owners, provided there are no "shut downs" or "slowing ups" of operation. It is easy to see that nearly all lost time must come out of this last 31 days.

Cost Accounting in the Paper Industry

Part IV—Standards; Their Principles and Uses

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THE matter of standards is of the utmost importance to the modern cost system for they are its backbone and on them depends entirely the value of the results secured. Standards are the tools used by the cost accountant in scrutinizing all the operations of the business and in ferreting out the hidden losses that nibble at the profits, losses often so great in the aggregate as to make the difference between a profit and a loss in times of stress. It is therefore essential that not only the cost accountant, but the entire management have a thorough knowledge of standards and their basic principles.

Objects of Standards

As explained in preceding chapters, the standards are the means whereby the actual results of the operations are measured and gauged. They serve not only the usual purpose of measuring results; but, as satisfactory results may be passed over and unsatisfactory results be made to stick out prominently, they should serve as well to focus the attention of the management of those things that need attention. In this way valuable time may be saved for important problems which would otherwise be consumed in having to go over all the figures. This concentration on items out of line is known as the "law of exceptions", for by it the exceptional points, the unsatisfactory ones, only have to be considered, while the great mass of figures which are usually all right may be disregarded.

It is obvious, therefore, that a great deal of time and attention must be given to standards, for if they are not correctly set, items are likely to be passed as correct which should be brought up for attention, or the standards may continuously call up items that eventually prove to be all right, and so defeat one of the objects of the system.

Standards may be classified in a number of ways, depending on the manner in which they are considered. They may be classified as to their purpose or as to their nature. Let us first consider that of their purpose and see the two major ways in which standards may be used.

The first and most usual form is to compare current operating conditions with what they should be at the present time. This is a common form of standards and very generally used and understood; but there is another purpose for which standards may be used—namely, to eliminate variables and develop trends. This is also a most important use, though not so commonly employed or understood. Let us examine this use first.

Prices of products, costs of raw materials and other items used in manufacture, and in fact all the items of the profit and loss statement tend to change from time to time, a change which is often gradual and sometimes quite difficult to trace. Such gradual changes are called "trends" and they play a very important part in the conduct of every business. It is often possible through a study of the trends of the important classifications of the income and expenses and their relation to each other to explain many puzzling features connected with the movement of profits—or losses. For example, cost of sales and prices received should bear a distinct relationship to each other.

Fixed Standards

There is only one way in which to follow continuously any given item—that is to compare it constantly with some standard that remains fixed. In this respect the fixed standard is similar to the familiar one used for measuring elevations, the sea level. Without this standard of comparison it would be impossible to compare elevations of different points all over the earth, but by comparing the altitude of each above the level of the sea, which is practically the same all over the world, the height of any one mountain can be readily compared with that of another anywhere else. In the same manner the status of some phase of the business today may be compared readily with its status tomorrow, next month or three years hence if we measure the amount it differs from some fixed and constant base. Thus standards may be set and then held unchanged for years, even for as long as the business continues and used for the purpose of measuring trends. In this use it is not the variation from the standard itself

that means anything to us—after a time we may expect quite material variations, but the amount by which the variation today compares with the variation at any other time. The standards themselves mean very little in this case, the important thing being that once set they should never be changed.

Eliminating the Price Variable

Another use for standards is to aid in the elimination of some of the variables, particularly that of price. In considering the cost to manufacture some item at different periods we are usually confronted with at least two things entering into the cost of manufacture that are subject to changes, the price of raw materials and items of conversion and the efficiency with which they have been used. Now usually we are unable to prevent these price changes and can do nothing about it, but we can control the efficiency. It is therefore important to find out the efficiency alone compared with that of some other period or against a standard. To do this we must eliminate the effect of the price changes. The easiest way in which to do this is to recalculate the cost, using current consumptions, etc., but using the same prices in both cases. For example, suppose we have the case of manufacturing soda pulp in which we have the following conditions at two different periods:

Period (A)

Wood	2.000	cords	@ $15.00	equals $30.00	per ton
Caustic	0.300	tons	@ 40.00	12.00	
Bleach	0.340	tons	@ 50.00	17.00	
Lime	0.500	tons	@ 10.00	5.00	
Conversion	0.100	digest.	@ 150.00	15.00	
				79.00	

Period (B)

Wood	1.900	cords	@ 19.00	equals 36.10	
Caustic	0.325	tons	@ 30.00	9.75	
Bleach	0.270	tons	@ 46.00	12.42	
Lime	0.480	tons	@ 11.00	5.28	
Conversion	0.100	digest.	@ 130.00	13.00	
				76.55	

Needless to say all prices and uses herein shown are entirely imaginary and used only for the purpose of illustration.

In the foregoing case the cost of the pulp has declined $2.45 a ton and it is desired to see how the efficiency of Period (A) compares with that of Period (B), usages and prices having all changed.

If we refigure the costs of Period (B) using the prices prevailing at Period (A), it is obvious that any changes in the final cost caused by changes of price are eliminated. In so doing we get:

Wood	1.900	@	$15.00	equals	$28.50
Caustic	0.325	@	40.00	"	13.00
Bleach	0.270	@	50.00	"	13.50
Lime	0.480	@	10.00	"	4.80
Conversion	0.100	@	150.00	"	15.00
					$74.80

We thus see that the cost declined, not because prices of raw materials fell off, but because the efficiency of their use increased. The price changes, indeed, tended to increase the costs.

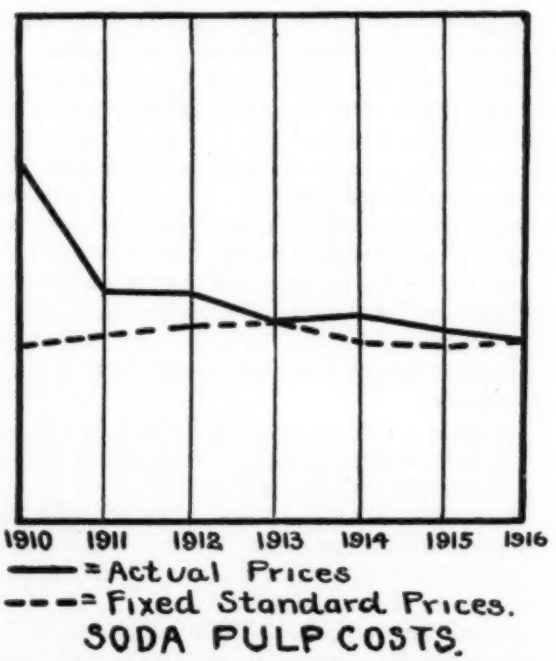
We may therefore set standard fixed prices for each item entering into the cost of a product and not only figure the cost at current prices but also at the set standard costs. In this case also the standards so set are maintained and never changed. If at the same time we work out a standard set of usages, with these and using the standard prices, we get a constant figure with which to compare the efficiency of operations at any time which will not be affected by prices and which will show the trend of efficiency for the process. In the same manner we may set standards of usages and, using the current prices, thereby get the extent to which changes in prices affect the cost of our product.

This then is one of the uses of standards. Fixed or set standards may be used to great advantage in determining trends and eliminating the price or usage changes.

The development of trends of the various phases of the business and their usefulness will be discussed at greater length in subsequent chapters.

Effect of Price Changes on Cost of Product

The accompanying chart of soda pulp costs illustrates the use of fixed standard prices. One curve



SODA PULP COSTS.

shows the price of a pulp, using current prices and rates. It will be noted that there has been a very material drop in the cost from the year 1910 and that the variations in the cost in other years was considerable. If, however, we refigure these costs, using

set fixed standard prices and rates, we get the cost after eliminating the effect of price changes. This is plotted in the other curve. Although fluctuations are still apparent they are comparatively slight, showing that while the actual efficiency of operations during the different years did vary, this variation had on the whole only a relatively small effect on the costs. The difference between the two curves shows how the cost of the product was affected by price changes.

In making standards either for the purpose of determining trends or of eliminating a certain factor, perhaps the best way is to use the prices and rates current at the time they are set. Sometimes arbitrary figures are used as, for example, round numbers to facilitate calculations, or a very high standard may be set. As the value is derived from the standards themselves and not from considering the amounts of the variations, but by a comparison of the amount of the variations at one period with the amounts at another, **it makes no difference what standards are used so long as they are maintained constant.** On account of this no time should be lost in setting such standards, but any convenient standards may be used that at the time may appear reasonable.

Comparison of Current Operations

The other great use of standards, and as said before, the most common one, is to compare the current actual operations with up-to-date standards. In this case it is the amount of the variations themselves that count and therefore the standards have to be set with great care. It is also for this reason that the standards are usually brought up to date at regular intervals; usually once a year or following any material change in prices or conditions of manufacture. Standards so set may be classified as to their nature, as for instance:

Standards of expense: Labor, supplies, etc.
Standards of operations: Hours per day, tons per day, etc.
Standards of consumption: Cords of wood per ton, etc.
Standards of price: Price per ton for pulp, etc.
Standards of efficiency: Paper machine efficiencies, etc.
Standards of allowable shrinkages: Finishing room shrinkage, etc.
Standards of production: Tons per day produced, etc.
Standards of allowable time: Hours required per ton, etc.

Standards of this sort may be fixed for a period or be flexible. By "Fixed" is meant that they remain unchanged for the period regardless of the extent of operations, whereas "Flexible" means that they are dependent upon the degree of operations. Thus the labor cost for a department may be set for a month and the actual compared with it and any variations explained by the fact that operations were less than normal, or the standards may be at the rate of per operating day or hour, etc., and variations will show the actual conditions directly.

In setting standards it is usual and best to take all phases in terms of normal operation. That is to say, standards of expense, production, hours run, etc., should be set for what would be considered an average good year. By normal is usually meant not necessarily the best possible but what would be considered very satisfactory. There is no exact definition of this, but in a sense the word is self-explanatory. In any event, all standards should tie up together for the same general idea. If operating hours are taken on the basis of 310 full days a year, then the expenses should be set on the same basis.

The problem of the cost accountant lies to a considerable extent in stating and determining the required standards. Let us consider each of the foregoing classifications and methods used in determining them.

Standards of Expense—These are the items that go to make up the expense of operating the centers or departments and are not the expenses or costs that go directly to the product itself, such as the raw materials, etc. Usually they comprise the following:

Fixed charges. The determination of these was considered fully in the recent series of articles by Mr. Gould which can be consulted in THE PAPER INDUSTRY (Vol. VIII, 5, 6, 7, 9 and 11; Vol. IX, 1 and 2), and will not be taken up here. The other items may be enumerated as follows:

Labor.
Supplies.
Compensation Insurance.
General Manufacturing Burden.
Steam.
Electric Power.
Water Power.
Repairs.
Redistributed centers.
Miscellaneous charges.

Labor—It is best to make up a standard payroll for each center, either on the basis of a full operating day or, as is sometimes the case, a week. A good form for this purpose is as follows:

BURDEN CENTER NO.

Occupation Number	Occupation	Hours a Day	Rate an Hr.	Cost a Day
331	Beatermen	144	.500	72.00
332	Beater helpers	144	.400	57.60
			Total cost a day.....	129.60

The same form would be used in case the period is for a week.

Assuming that the daily period had been taken the cost of labor for a year is then calculated as follows:

	A Period	Year
Standard rate a day	$129.60	
Year, basis 310 days		$40,176.00
Sunday labor, a day	20.00	
Year, basis 52 Sundays		1,040.00
Holiday labor, a day	12.00	
Year, basis 3 holidays		36.00
Salaries, monthly	166.66	
Year, basis 12 months		2,000.00
Overtime a day	25.00	
Year, basis 310 days		7,750.00
Total a year		$51,002.00

It is customary for the foreman to prepare these daily standard payrolls, which then go to the factory superintendent for approval and after being trimmed down as much as possible are incorporated in the standard expenses for the center. It is important that everything be included and no essential feature, such as Sunday labor, normal overtime, etc., be omitted. If such a form be adopted it may be used in more than one way; for example, it may be used in daily mill reports to control the labor from day to day. It is vastly better to make up the estimates in this way than to attempt to make a lump sum esimate for labor for a month or a year without such an analysis.

Of course where a weekly standard is made it should include Sunday labor and normal overtime, and then all that is necessary is to multiply this by 52 and add the annual salaries. However, the daily form is better because, as previously mentioned, it may be used as the basis of a daily control.

(To be Continued)

Lessons in Paper Making

Lesson XXVI—The Theory of Color

By HARRY WILLIAMSON
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This article is the twenty-sixth of a series of lessons in practical paper making, appearing in The Paper Industry by arrangement with the Champion Fibre Company, Canton, N. C. These lessons are a part of the general education course, conducted by this company under the direction of Mr. J. Norman Spawn, educational director.

THIS month we are going to have a little more "high brow" stuff. In the last two lessons we waded through several boresome figures and calculations. We are not going to bother with many figures in this lesson, and the few we will quote are of such huge dimensions as to be almost beyond the conception of the human brain. In previous lessons we have started with the practical application of the subject under discussion and then later we have progressed into the realms of theory. This has been done because we are practical papermakers and we most need to know how to accomplish results in daily operation. We are not all color men, however, but we all ought to know something about color.

With a subject of this nature, it is so much better to start with the theory so that we may better understand the practical application. The conclusion we must draw from this is that the art of coloring paper is of such a delicate nature that a thorough understanding of the principles involved is more necessary than copyist methods. Application of mechanical principles can be efficiently controlled by knowing **how**, and the why is not immediately necessary unless the questing brain demands to know why. In coloring paper, however, personal judgment is absolutely essential. Conditions may change from beater to beater, strengths of dyestuffs may change, conditions of cooking with subsequent changes in the stock, a sudden rain changing the chemical content of the water. Therefore, the color man cannot follow a rule blindly, and it is absolutely essential that he first know **why** and then **how.** We will start off then, by making a few bold, flat statements and then proceed to prove them.

Light and Color

Radiation is light. Light is a wave motion. **Light is color and color is light.** Without light there can be no color. We do not intend to attempt the colossal task, far beyond this writer's mental capacity, to prove these statements by calculations of our own. We are simply going to recapitulate scientific truths evolved by brilliant scientists and known for centuries, and then apply these wonders of nature to add to the sum of our knowledge in the more prosaic art of coloring paper.

Surrounding this old mother earth of ours is a belt of air which we know as atmosphere. Beyond this belt of air, stretching into illimitable space between the earth, the sun, the moon and the stars is a something which the scientists have called ether. This ether of space is everywhere. It is a substance finer than any known to our five senses and it extends beyond the farthest star and penetrates the densest bodies. It exists in a ball of the toughest steel like water in a sponge, but you can't squeeze it out as you can water from a sponge, for as long as the steel ball takes up the least bit of space, it takes on just that same amount of ether.

It has taken thousands of years for men to understand what light is, and there is no wonder, for few

things are more baffling to the mind. Even now we do not thoroughly understand it. It used to be thought that light darted out from the sun as a bullet darts out from a gun, but men did not know in those days that if light had been a thing like that—something that could be picked up and flung away—the grains of it would have reached the earth with such force as to fall on us like stones or cannon balls. We now believe that light is a wave motion in the ether, the marvelous stuff that fills all space and goes through everything.

It has been discovered that it takes light about eight minutes to travel from the sun to the earth. What becomes of it after it leaves the sun and before it reaches the earth? If there were absolutely nothing along the 92 million miles between us and the sun, neither light, radiant heat, nor anything could travel through that space. If there were no air, there would be no sound, for sound travels along air waves. These air waves are, however, much too slow for light and radiant heat which travel along ether waves. This form of travel is called "radiation".

A ray of light is not flung out of the sun and thrown to the earth as we would throw a stone. It is not a thing apart that we can get hold of and carry from one place to another. A ray of sunlight is a continuous shaft that spreads for more than 90 million miles, a mighty band of quivering ether, an unbroken chain moving up and down so fast that we can only compare the number of its little waves to the grains of sand on the sea shore.

The Theory of Sound

We can better understand the theory of light, or the theory of color, for both are the same thing, if we discuss for a few moments an analogous subject with which we are all familiar in these modern days of radio and wireless telegraphy—the theory of sound. The study of sound is a study of vibrations in the **air** created by various vibrating bodies. The important difference between light and heat vibrations and sound vibrations is that the light and heat vibrations are transverse or crosswise, while the sound vibrations are lengthwise. If we hold a tuning fork, or an ordinary table fork loosely and strike the tines sharply against a table top, the tines of the fork will vibrate and these vibrations will set up vibrations along the sound waves in the air which we recognize as a tone or pitch. Now if we place the handle of the form against the table top, the tone will be louder and deeper. The vibration of the fork tines are transmitted and intensified by the vibrations of the table top. Try this stunt again and then place your hand on the table top and you will **feel** the vibrations as well as **hear them.**

A locomotive whistle rises to a shrill shriek as it approaches and dies away to a low mournful wail as the train recedes. The reason that the note sounds higher as the train approaches and lower as the train departs, although the whistle is emitting vibrations at the same rate all the time, is because the ear receives the vibrations crowded together into shorter waves in the first case and dragged out into longer waves in the second case.

We have all seen the wiring and sounding board of a piano. The high notes are the shorter strings because these emit more vibrations per second. The low notes are the longer strings because these emit less vibrations per second. The long pipes of an organ emit the base notes and the short pipes the high notes, for the same reason. The range of musical notes lies between the range of 30 and 4000 vibrations per second. Above 4000, the note becomes a squeak or a squeal. This type of sound wave is, however, the laggard, the crawler among the family of air and ether waves of which light, or color, is a member.

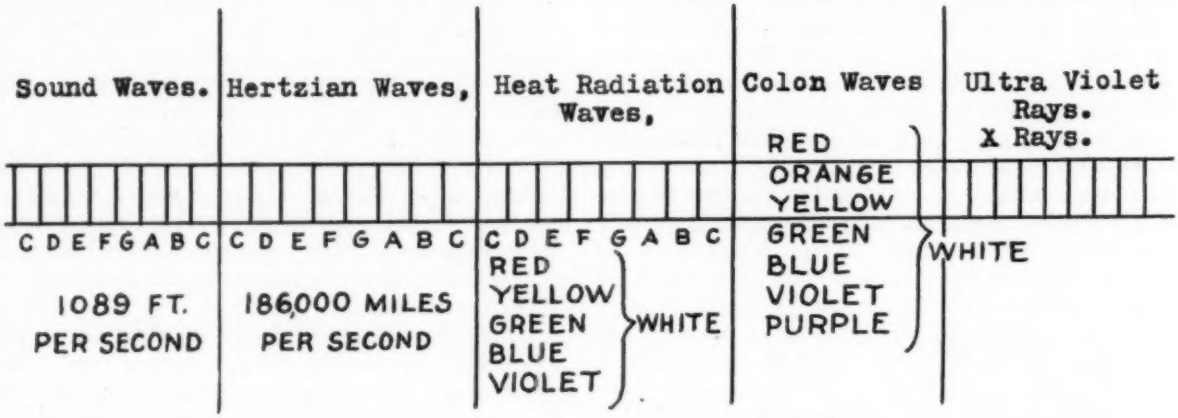
Sound only travels about 1089 feet per second, while light travels 186,000 **miles per second.** That is why we see the lightning before we hear the thunder. During the war, when we saw the flash of a big gun, without waiting to study physics or the theory of light, we ducked damned quick, yes, brother, even before we heard the explosion of the gun or the whine of the shell. That is perhaps why we are here banging away on this typewriter tonight. We proved to be a champion ducker.

Nearly fifty years ago, David Edward Hughes, the inventor of the microphone, found unexplained electric "impulses" in space. Several years before Hughes' experiments, a great British scientist, James Clark Maxwell, had shown mathematically that it must be possible to have free electric waves in the ether similar to those of light. Some years later, a brilliant young German, Heinrich Hertz, set out to test this theory. By 1887, he had devised and announced not merely a transmitter for sending out such waves into the ether, but also a crude detector for receiving them. The existence of electric waves was thus proved and they now carry the name of Hertzian Waves in honor of the discoverer. It is interesting to know that these waves traveled through space in numbers varying from 30,000 to 3,000,000 in a second, varying in length from 300 to 30,000 feet and traveling with the **speed of light, 186,000 miles per second.** To use the vernacular of the day, that is **some speed, some length** and **some vibrations,** yes, and then **some.**

Scientists tell us that electric current consists of a swarm of negative electrons, or minute specks of negative electricity, flowing through a conductor. Each speck carries its field, that is, makes its electric influence felt through space. When many specks are present, they unite their individual fields into a strong combined one. When an electric current is created in the ether, the sudden movement of the electrons disturbs the ether radiating outwards and setting in motion other groups of electrons it

may encounter. By this means, electric waves are set up and **directed to their destination.**

Now that we know a tiny little bit about air and ether waves, suppose we make a sketch which will help us to vizualize the subject far better than the gigantic figure indicators. In this little sketch we



see depicted the family of air and ether waves as a five octave piano keyboard. Down in the bass clef we have the sound waves, the laggard of the wave family, transmitting sound in tone or loudness dependent on the **amplitude of vibrations created by striking one object against another.** In the next octave, we have the free electric waves, harnessed to our service to transmit sound by the use of an electric current discharged into the ether **and creating vibrations vastly faster and greater in a number per second than those created by striking together solid objects.**

Radiation of Heat

In the next octave we have heat radiation waves. Heat, as we know, travels three ways, by conduction, by convection and by radiation. When we put one end of an iron bar into the fire, the rapidly moving molecules of the hot coals and the hot gases strike against the molecules of iron. The iron molecules that first touch the fire are given motion, and this motion is transmitted to the iron molecules farther back in the iron, and soon the heat travels or is **conducted** along the full length of the iron. Just as if we had a string of balls and gave the first one a bump. If we take the hot iron out of the fire, the air is heated and the hot air **rises,** transmitting the heat **upwards.** This travel of heat is by **convection,** that is, by being conveyed by heated currents. But if we place a hand **beneath** the hot iron, we can still feel the heat. We are not holding the hot iron with that hand, so we do not feel the heat by conduction; there is no stream of hot air **downwards** because hot air **rises.** Therefore, we do not feel the heat by convection. The heat we feel, leaps across space just as heat and light come to us from the sun. This method of heat travel is called **radiation.** The longer the distance between the hand and the hot iron, **beneath** the iron, the **less** we feel the heat. We can increase this distance until **we do not feel the heat at all by radiation. We have then placed the hand beyond the range of either actually disturbed by the rapidly moving molecules of hot iron. The hotter the iron, the faster the molecules move, the greater the vibrations created in the ether, the longer the distance heat is transmitted by radiation.**

From this simple fireside experiment, we can arrive at a very, very faint conception of the movement of the molecules of matter comprising the burning sun, the **immensity of the vibrations per minute transmitted to the ether by the movement of these burning molecules.** If we can transmit heat by radiation from a red hot poker for a distance of three feet, just think of the vibrations necessary to transmit heat over a distance of 92 million miles existing between mother earth and the sun.

Radiated Light

Earlier in this article, we made the statement that **radiation is light, light is color and color is light.** We can use our fireside experiment with the poker again and watch the development of **radiated light.** When first put in the fire, the poker is **black,** then heat is developed by the vibration of the molecular iron and the poker begins to show a dull red. The faster the molecular vibration, the greater the heat developed and the poker then shows bright red. Faster and faster the molecular structure of the iron vibrates, higher and higher rises the temperature of the heat created, and the poker then radiates in succession a yellow light, then green, then blue, then violet, and finally, **it becomes white hot, a** white light is emitted. We, therefore, see that the color of light is determined by **vibration frequency,** or, in other words, by the corresponding **wave length.** A body which emits **white light** sends forth **simultaneously** the variety of wave lengths each comprising a color and the **simultaneous sum creating white.**

The radiation of the heat of the sun is the radiation of **a white hot heat, a simultaneous emission into the ether of a variety of wave lengths each comprising** a separate color of the spectrum.

Make a small pin hole in a piece of cardboard, then peer through this pin hole at the sun at high noon on a clear day, and you will see **pure white.** The sun's rays **reflected** from the full moon is pure white because **the moon reflects the vibratory waves emitted from the sun at exactly the same speed that it receives them.** Any object which does **not reflect these vibratory waves simultaneously will be a colored object.**

When we dye a sheet of paper, we deprive it of its ability to reflect some of the component colors of **white light.** We have added something to the paper which absorbs or subtracts certain components or colors, the sum of which comprise white light. What is not absorbed is **reflected** and that **reflection** is the color of the paper.

Color Waves

In the next octave on the piano keyboard we have **color waves,** the waves emitted into the ether by the molecular vibration of the burning sun mass. There are seven of these waves, each with a different length, each with a different **vibration frequency,** and each forming singly a separate color. It seems almost absurd to speak of **length** as we understand the term in relation to these color waves. The longest of them, the **red** color wave requires 34 thousand to make one inch and has a vibration frequency of 395,000,000,000,000 per second. The following table shows the length in millimeters and the vibration frequency of each color wave.

Color	Length in millimeters.	No. of waves per second.
Dark Red	.000760	395,000,000,000,000
Orange	.000656	458,000,000,000,000
Yellow	.000589	510,000,000,000,000
Green	.000527	570,000,000,000,000
Cyan Blue	.000486	618,000,000,000,000
Ultramarine Blue	.000431	697,000,000,000,000
Violet	.000397	760,000,000,000,000

The immensity of these figures can scarcely be conceived. We can see, however, the analogy of the piano strings. The shortest color wave, the violet, has the greatest vibration frequency, and the longest color wave, the red, has the lowest vibration frequency. These colors are the basis colors of all tints and shades ever created. A few years ago, the whole seven were called the primary colors. Now, however, we say **red, yellow and blue are the primary colors.** These color waves are known as the colors of the spectrum. Radiated from the sun with equal vibration frequency they form **white light. Split a beam of white light so that each wave length assumes its separate vibration frequency and we have seven separate colors, the colors of the rainbow.**

In our next lesson we will deal with refraction and reflection of the color waves. **Radiation is light, light is color and color is light. Without light there is no color.**

Paper Making Problems

Answers to Questions

By HARRY WILLIAMSON

Mr. Williamson has received volumes of letters from readers of THE PAPER INDUSTRY *since publication of his Lessons in Paper Making was started in June, 1926, asking him to solve specific problems encountered in their respective mills.*

Beginning with this number, these questions and Mr. Williamson's answers will be published and appended to the regular monthly lesson in each issue. Identification of mills or individuals asking these questions will be deleted from the text.

Woolen Felt Terminology

QUESTION—In ordering woolen felts for newsprint machines or for fourdrinier machines generally, do you recognize two different kinds of woolen felts, namely wet felts and press felts? Do you recognize the distinction as outlined in the two paragraphs following, and in your experience is this distinction commonly made in newsprint mills particularly?

"By a wet felt for a newsprint machine we mean a Common Fourdrinier Wet such as is used on the first press. It is also occasionally used on the second press by certain mills. This felt has a very open weave and is made from strong, long-wearing wools to give a long life and a high rate of water removal.

"By press felts we mean a Fine Fourdrinier Press such as is ordinarily used on the third press or a newsprint machine. This felt is made from finer wools and is more closely woven, and while it removes some water it is designed also to give a certain amount of finish to the sheet. These F. F. press felts would also be used on the fourth press, although there are very few machines equipped with that many presses."

ANSWER—Do you recognize two different kinds of woolen felts, namely wet felts and press felts? **Yes.**

Do you recognise the distinction as outlined in the two paragraphs following, and in your experience is this distinction commonly made in newsprint mills particularly? **Yes, with qualifications.**

Newsprint Mills—The term wet felt is applied by common custom to the first felt because its **primary** duty is the removal of water. The question of felt impression left by the weave of this felt is of very secondary importance, the removal of felt impression being the duty of the **third press felt** primarily with the removal of water a bad second.

The wet felt is usually interchangeable with the second felt, but the term wet felt is not applied to the second felt either by common usage, or when ordering. The fact that there is sometimes a closer weave and heavier weight used on the second press according to the local requirements, gives it the distinction of the term the **second felt.** The third press felt is always termed a **press felt.**

To the machine tender the term wet felt instantly conveys the thought of a light weight felt that he can wash, rope up and turn over at full speed. The term second felt implies a warning that it is a heavier felt and a little more care must be taken. The term press felt very definitely means "turn over very carefully," because it is thick and heavy.

Fine Mills—In mills such as this the term wet felt is not used. In common usage the press number is given such as First Press, Second Press, etc. When ordering, the term press felt and the symbol or number indicating the design or weight of the felt is given. While of course the first and second felts are the principle water removers, they must still be of a design which will not leave a felt impression. In fact so important is this that we often slow a machine down in order to use less weight on the press levers to lessen the possibility of felt impression. Such action would never be even considered with a wet felt.

The very finest weave, used as a finishing felt is always given its full name, **press plate felt.**

Cylinder Machines—By common usage and also when ordering, the following terms are used for felts on cylinder machines. The felt that comes in contact with the cylinders, has the showers running on it, and has the whipper beating it, is termed **the wet felt.**

The felt which partners the wet felt, passing through the sqeeze rolls with the paper board between it and the wet felt, and whose **primary** duty is to lay the top fiber and prevent it sticking to the squeeze rolls while the water is being squeezed **from** the paper board and **through** the wet felt, is termed **the top felt.**

The felt which carries the board through the press is termed **the press felt.**

In the above instance, by far the greatest amount of water is removed by the passage of the wet felt, paper board, and top felt through the squeeze rolls. The presses on a cylinder machine are **primarily** finishers rather than water movers.

Summary—Where the primary duty is water removal with very little regard for the felt impression left in the product, the term **wet felt** is commonly accepted.

Wherever the factor of felt impression assumes an importance nearly equal, or more than equal to the water removal qualities, **the term press felt is generally accorded.**

Reburned Lime in Sulphate Process

QUESTION—Do or can you use the reburned lime in the sulphate process, or is it all used in the soda process? What I have in mind is, would it be profitable for us to put in a Kiln?

ANSWER—From an operating point of view I do not know of any reason why reburned lime should not be used in the sulphate process. It is a question solely of economics and that would be decided by the volume to be handled and the cost of fuel.

The point I have particularly in mind is, the lime kiln has to have its tremendous length, initial temperature, and stack temperature to operate at all. If you are going to keep it fed to its full capacity of lime sludge, it will not cost any more to operate than if you only use half its capacity; that is, as far as labor and fuel are concerned. On the other hand, only using half capacity there would be greater heat radiation losses and the cost per ton of reburned lime would be considerably higher than when running on full capacity.

A lime burner is a profitable investment, if you handle a very large volume. Herewith are a few facts which may help form your opinion.

Length of Rotary Kiln.....120'
Diameter . . . . . 10'
Revolutions per minute..... 3.
Fuel—Gas produced from coal in special gas producer sucked through the kiln from gas containers by the Stack vacuum.
Coal used per day.....Average 10 tons.
Capacity of lime kiln.....50 tons per day.
Stack Temperature . . . . . .600 degrees Fahr.

The reburned lime is mixed directly with the leached liquor, tests being made until the desired causticity is reached. Leached liquor should run about 9 degrees Beaume.

Here are the figures for a full day's economical run in relation to lime recovery. A "liquor" equals 10,500 gallons. Each "Liquor" requires 6,500 lbs. of lime to get the required causticity. A day's run should equal 21 "Liquors." The amount of new lime added is also shown, and therefore the amount reclaimed.

No Of "Liquors"	Volume Gallons	Lime Required At 6,500 lbs. per "Liquor"	New Lime Added.	Lime Reclaimed
21	220,500.	136,500 lbs.	39,000 lbs.	97,500 lbs.

The efficiency of the burner for that run was therefore high, it supplied 48.75 tons of reburned lime to a requirement of 68.25 tons.

That I think is the deciding factor in using a lime burner. If your requirements are slightly larger than the capacity of the kiln running at full capacity, you not only get the most economical operation of the kiln itself, you also keep down impurities and freshen up the liquor system by the regular addition of small quantities of fresh lime.

Wire Travel

QUESTION—If one side of the stretch roll on a wire is tightened—toward what direction will the wire travel?

ANSWER—I think most of the controversy regarding wire travel arises from the fact that we fail to remember that a wire once **tightened** does not necessarily mean that the side on which the stretch roll has been lowered will remain the **tightest** side. Temporarily it will be tighter, but as the wire is somewhat elastic it will eventually stretch and become **longer** and **slacker.**

Your question "If one side of the stretch roll is tightened—toward which side will the wire travel" is very concisely put and can be answered in an equally concise manner.

The wire will run towards the side that has been tightened down.

Now comes the ineveitable **"why."** Without a reason this answer would be incomplete and still unsatisfactory.

All guiding control is a question of **tension** or **pressure.** You will no doubt have read this expression in my articles regarding felts, both wet and dry.

Another rule is, the guiding roll actuates on the rectangle **preceeding** it, and the **effect is held by the rectangle succeeding the guide roll.** Hence, with dry felts we have a **long** draw to the guide roll and a **short** draw **after** the guide roll. Should the draws be of equal length, the guide roll—unless the felt were wrapped round it forming a large arc of contact —would have very little effect.

The guiding is effected at the point where the greatest **tension, weight,** or **pressure** is operative, and in relation to dry felts we have **tight** and **slack** side felts only because this point is changeable according to the design of the felt frame. **Tension, weight, pressure** are in this instance only expressions of **traction.**

When the wire guide roll is checked forward on the front side, the wire travels to the back side. Now here we have the cause of much debate on wire travel. By this action the guide roll actually **tightens** the wire between the guide roll and the couch roll and the wire presumably runs to the **slack** side. What actually happens, however, is that the wire has first **grip** or **traction** on the back side of the guide roll and its effect is held by the extremely short tight draw to the couch roll.

Where a top couch roll is used we see further evidence of this effect. Should the top couch roll be more "couched" on the back side than the front side—that is, sitting lower down on the wire—the wire will run to the back side. This is because the top couch roll has **first traction effect** on the back side which is in contact with the wire before the front side.

The guide roll succeeding the wire stretch roll is another interesting proof of the **traction effect.** Should this particular guide roll be moved forward on the front side, that is, in the direction of the wire travel, the wire will **again** run to the back side. Yet when we move the guide roll forward in this manner, we are actually **slackening** the wire draw between the stretch roll and the guide roll on the side moved, that is, the front side. The wire has therefore run to the **tight** side.

In relation to "tight side" and "slack side," this is contrary to the action of the regular guide roll. We therefore see it is a question of **traction grip** rather than a question of tight or slack as such.

Another little interesting experiment can be made with the breast roll if it should be crowned a little. By tightening up the shake bar until the breast roll is pulled over to the back side, you will find the wire will run to the back side, that is, **"it will follow the crown."** In other words, the wire will hold its grip or tension on the high part of the breast roll.

A belt will run to the high side of a cone pulley.

A dryer felt once it gets round the edge of the dryers on one side will continue to pull to that side despite the action of the guide rolls.

Perhaps we can use a very crude simile in this question of traction pull. Should a tire on the car gradually go down the effect will be felt on the steering wheel by a constant pull **towards** the collapsing tire. The traction of the tire on the road is increased by the number of square inches of contact with the road and these are increased as the tire goes down.

Current Thought by William Sibley

Business Ethics

NO ONE can build by destructive methods. This axiomatic truth is too often disregarded by those who have payrolls to meet, mill capacities to maintain, presses to keep running, quotas to fill, space to sell, or other business to do. Just why so elementary a truth should be so completely disregarded, I hope no one will ask me to explain. Perhaps it is because of the triteness developed by constant repetition. As long ago as two thousand years we were told, in language the clarity of which has never been improved upon, that: "Whatsoever ye would that men should do unto you, do ye also unto them." Unfortunately, by the very nature of things, constant repetition tends to make commonplace even the most beautiful. But whether we like it or not, that command of so long ago, commonly known as the Golden Rule, is today **the rule for making gold.**

Upon being released from military service ten years ago, I took the position of circulation manager for a Chicago trade journal. My success in that position depended upon my ability to write successful sales letters, since we secured our circulation entirely by mail. To make myself a writer of more resultful letters, I took a course of instruction in sales letter writing from the La Salle Extension University. In making application for that course, however, I became involved with two salesmen—the first one of whom wanted to sell me a course of instruction called "Business Administration", while the second one could sell me the desired "Sales Letter" course. Being exactly what I wanted, I subscribed to the latter. Losing the sale (and the commission) inflamed the first salesman with anger and caused him to enter upon a tirade of abuse against the second salesman, his course, and my buying judgment so severe as to cause me to literally kick him out of my office. Later on I spoke of the incident to the second and successful salesman, but he was gentleman enough to make only a trifling answer, then change the subject.

Today the first salesman is making a rather poor attempt at selling typewriters. The second salesman is a high official in the LaSalle Extension University.

No one can build by destructive methods.

During the intervening ten years I have been identified constantly, either directly or indirectly, with the publishing business. Having come to know, personally and well, the editors of at least one hundred magazines I can make this statement without fear of successful contradiction: The publisher who practices unethical methods is invariably the publisher of a weak magazine. Since it requires at least one exception to make a rule, (the only thing on earth having no exception being a principle) there are doubtless exceptions in the publishing business. Hence, the insertion, in the above statement, of the word "invariably." But show me the man who makes it a practice and a habit of calling his contemporary a liar, berates his product, minimizes his merit or maligns his integrity, and I will show you a man who has a second rate magazine, locomotive, automobile, lip stick, peanut butter—or whatever his product may be.

No one can build by destructive methods.

There is a new industry in our midst—an industry that was practically non-existent ten years ago. I refer to the radio industry. When radio was new, and there were so many home-made, poorly constructed receiving sets in use, the thirty-five active broadcasting stations in Chicago entered upon a "gentleman's agreement" that Monday night should be "silent night." This was a night for the amateur to try for distant stations and to further his personal experiments in radio reception, without the interference of the crowded Chicago air. This agreement went along beautifully until one Monday night, a local Chicago station went on the air with a prominent U. S. senator as its speaker. They did so with malice aforethought, their idea being to advantage themselves with the lack of competition among Chicago stations. They broke their gentleman's agreement for personal prestige. This station does not exist today.

No one can build by destructive methods.

In the radio industry there are those, however, who have high ideals. One such man is Adolph F. Linden, President of the American Broadcasting Company, which is an association of Pacific Coast

broadcasting stations. Recently Mr. Linden established a code for the guidance of his employees. This code is reprinted here, because its principles might well be applied to every known branch of commerce.

Code for ABC Pacific Coast Chain

"Your first consideration is the listening audience.

"The confidence, the good will, and the trust of the listeners must never be violated.

"Never permit anything to be broadcast that could be construed as being suggestive or objectionable. The vision before you always should be the sanctity of the home, where you are privileged to enter.

"This station is for everyone. It is the mouthpiece for all. Do not grant privileges to anyone, regardless of race or creed or of politics, that you would not grant to all.

"All employees in this organization are expected to be happy in their work. It is desired of all members that they conduct their duties happily and with enthusiasm. Happiness makes duties lighter and accomplishments greater. Everyone enjoys meeting happy people. Be happy, radiate happiness, and all listeners will be attracted to your station.

"Do not bring your troubles into the studio. If you are not happy in your work and enthusiastic over its possibilities, you will never be successful in it, and for your own future, you should be doing something else.

"There is nothing so contagious as enthusiasm and there is nothing impossible for loyal, happy and courageous hearts filled with enthusiasm. You can believe that ours is the greatest opportunity in the world for service.

"Accomplish your share of duties happily and with enthusiasm.

"Remember that the fellowship of those with whom you work is a vital necessity for success. An understanding fellowship, friendliness and regard for each other are wonderful incentives that inspire true happiness and greater accomplishments for us all.

"Do not depreciate your competitors—speak well of them. You have so many good things to tell of your own organization that it ill becomes you and lessens your dignity to belittle others.

"Say the things about your fellows and your organization and do the things that you would have the world think and say about you."

Another Code of Ethics worthy of every business man's consideration is that of the National Association of Real Estate Boards. From this remarkable Code I have selected only seven of the thirty-five articles. These seven are published here because of their adaptability to every branch of industry. Indeed, one might readily substitute for the word "Realtor" wherever it appears the word "salesman", "paper manufacturer", "jobber", or any other word that would signify a business group.

"In the best interest of society, of his associates, and of his own business, the Realtor should be loyal to the real estate board of his community, and active in its work; and he should willingly share with his fellow-members the lessons of his experience.

"A Realtor should never publicly criticize a competitor; he should never express an opinion of a competitor's transaction unless requested to do so by one of the principals, and his opinion then should be rendered in accordance with strict professional courtesy and integrity.

"A Realtor should never seek information about a competitor's transaction to use for the purpose of closing the transaction himself or diverting the customer to another property.

"The schedules of fees established by the various real estate boards are believed to represent fair compensation for services rendered in their communities and should be observed by every Realtor.

"A Realtor should not solicit the services of any employee in the organization of a fellow-Realtor without the knowledge of the employer.

"When asked for an appraisal of real property or an opinion on a real estate problem, the Realtor should never give an unconsidered answer; his counsel constitutes a professional service which he should render in writing over his signature and only after having ascertained and weighed the facts, for which he should make a fair charge. The Realtor should not undertake to give an appraisal on any property in which he is in any way interested whatsoever, unless such interest is specifically disclosed in the appraisal report, and under no circumstances should be undertake to give an appraisal or opinion when his employment is contingent upon the amount of his appraisal or the character of his opinion.

"Property should be offered by a Realtor solely on its merit without exaggeration, concealment, or any form of deception or misleading representation."

Ethics apply alike to all men. Whether it be with the office boy, the trucker, the machine tender, the beater foreman, the cooker, the comptroller or the chairman of the board, the degreee in which their conduct is ethical determines the degree of success attained. There is no better way to put it than will be found in **the rule for making gold.** "Whatsoever ye would that men should do to you—do ye also unto them."

120 Mills Enter Contest for 1929

The Paper Industry Fifth Annual Safety Contest Registers 16 New Participants

	ENTRANT	MILL	LOCATION
Group A—28 Mills	Bird & Son, Inc.	East Walpole	Massachusetts
	Bogalusa Paper Co.	Bogalusa	Louisiana
	Can. P. & P. Corp.	Laurentide	Grand Mere, Que., Can.
	Can.P. & P. Corp	Belgo	Shawinigan Falls, Quebec, Can.
	Champion Coat. P. Co.	No. 1	Hamilton, O.
	Champion Coat. P. Co.	No. 2	Hamilton, O.
	*Container Corp. of America	Manayunk	Philadelphia, Pa.
	*Cont. P. & Bag Corp.	Rumford Falls	Rumford, Me.
	*Crown-Willamette P. Co.	Camas	Washington
	*Crown-Willamette P. Co.	West Linn	Oregon
	Dill & Collins Co.	Delaware	Philadelphia, Pa.
	*Hoberg Pap. & Fib. Co.	Green Bay	Wisconsin
	Int. Paper Co.	Niagara Falls	New York
	Int. Paper Co.	Hudson River	Palmer, N. Y.
	Int. Paper Co.	No. 2	Fort Edward, N. Y.
	Int. Paper Co.	Otis	Chisholm, Me.
	Kimberly-Clark Corp.	Niagara	Wisconsin
	Kimberly-Clark Corp.	Kimberly	Wisconsin
	Kimberly-Clark Corp.	Falls	Niagara Falls, N. Y.
	Marathon P. Mills Co.	Rothschild	Wisconsin
	Marinette & Menominee Paper Co.	Marinette	Wisconsin
	Mead Pulp & Paper Co.	Chillicothe	Ohio
	Minn. & Ont. Paper Co.	Int. Falls	Minnesota
	Nekoosa-Edwards P. Co.	Port Edwards	Wisconsin
	Northern Paper Mills	Green Bay	Wisconsin
	Northwest Paper Co.	Cloquet	Minnesota
	Powell River Co., Ltd.	Powell River	British Col., Can.
	W. Va. Pulp & Pap. Co.	Luke	Maryland
Group B—36 Mills	*Albemarle P. Mfg. Co.	Richmond	Virginia
	Amer. Writing P. Co.	Beebe-Holbrook Wauregan	Holyoke, Mass.
	Amer. Writing P. Co.	Crocker	Holyoke, Mass.
	Bemis Bros. Bag Co.	Peoria	Illinois
	*Brown P. Mill Co., Inc.	Monroe	Louisiana
	Bryant Paper Co.	Bryant	Kalamazoo, Mich.
	*Cont. Corp. of Amer.	Ogden Ave.	Chicago, Ill.
	*Cont. Corp. of Amer.	Coated Board	Chicago, Ill.
	*Cont. Corp. of Amer.	Red Bank	Cincinnati, O
	Cornell Wood Prod. Co.	Cornell	Wisconsin
	Defiance Paper Co.	Nos.1 & 2	Niagara Falls, N. Y.
	Escanaba Paper Co.	Escanaba	Groos, Mich.
	Falls Mfg. Co.	Oconto Falls	Wisconsin
	Finch, Pruyn & Co. Inc.	Glens Falls	New York
	Ft. Frances P. & P. Co.	Ft. Frances	Ontario, Can.
	*Grt. Lakes P. Co., Ltd.	Ft. William	Ontario, Can.
	Grt. Western Paper Co.	Ladysmith	Wisconsin
	Hollingsworth & Vose	East Walpole	Massachusetts
	Hollingsworth & Vose	West Groton	Massachusetts
	Int. Paper Co.	Piercefield	New York
	Int. Paper Co.	DeGrasse	Pyrites, N. Y.
	Kenora Pap. Mills, Ltd.	Kenora	Ontario, Can.
	Kimberly-Clark Corp.	Badger-Globe	Neenah, Wis.
	Mead Fibre Co.	Kingsport	Tennessee
	Michigan Paper Co.	Plainwell	Michigan
	Mosinee Paper Mills Co.	Mosinee	Wisconsin
	Nekoosa-Edwards P. Co.	Nekoosa	Wisconsin
	*Ontonagon Fibre Co.	Ontonagon	Michigan
	Racquette Riv. P. Co.	Potsdam	New York
	Rhinelander Paper Co.	Rhinelander	Wisconsin
	*Richardson Co.	Board No. 3	Lockland, O.
	St. Croix Paper Co.	Woodland	Maine
	Scott Paper Co.	Chester	Pennsylvania
	Strathmore Paper Co.	No. 2	Woronoco, Mass.
	Strathmore Paper Co.	No. 1	Mitteneague, Mass.
	Warren Mfg. Co.	Milford	New Jersey

	ENTRANT	MILL	LOCATION
Group C—56 Mills	Adams Bag Company	Chagrin Falls	Ohio
	Amer. Writing P. Co.	Albion	Holyoke, Mass.
	Amer. Writ. Paper Co.	Linden	Holyoke, Mass.
	Amer. Writ. Paper Co.	Mt. Tom	Holyoke, Mass.
	Amer. Writ. Paper Co.	Nonotuck	Holyoke, Mass.
	Amer. Writ. Paper Co.	Parsons	Holyoke, Mass.
	Amer. Writ. Paper Co.	Platner-Porter	Holyoke, Mass.
	Amer. Writ. Paper Co.	Riverside	Holyoke, Mass.
	Amer. Writ. Paper Co.	Windsor	Holyoke, Mass.
	*Bedford P. & P. Co.	Big Island	Virginia
	Bergstrom Paper Co.	Neenah	Wisconsin
	Beveridge Paper Co.	Indianapolis	Indiana
	Bird & Son, Inc.	Phillipsdale	Rhode Island
	Bryant Paper Co.	Milham	Kalamazoo, Mich.
	Bryant Paper Co.	Superior	Kalamazoo, Mich.
	*Cont'r Corp. of Amer.	Mid-West Div.	Circleville, O.
	*Cont'r Corp. of Amer.	Mid-West Div.	Kokomo, Ind.
	Con. P. & Bag Corp.	Ashland	New Hampshire
	Crystal Tissue Co.	Middletown	Ohio
	Defiance Paper Co.	No. 3	Niagara Falls, N. Y.
	Diamond State Fib. Co.	Bridgeport	Pennsylvania
	Franklin B. & P. Co.	Franklin	Ohio
	Gardner & Harvey Co.	No. 1	Middletown, O.
	Gardner & Harvey Co.	No. 2	Middletown, O.
	Gardner & Harvey Co.	No. 3	Middletown, O.
	Int. Paper Co.	Livermore Falls	Maine
	Int. Paper Co.	Montague	Turners Falls, Mass.
	Int. Paper Co.	Riley	Maine
	Int. Paper Co.	Webster	Orono, Me.
	Int. Paper Co.	Winnipiseogee	Franklin, N. H.
	Itasca Paper Co.	Grand Rapids	Minnesota
	Kimberly-Clark Corp.	Atlas	Appleton, Wis.
	Kimberly-Clark Corp.	Neenah	Wisconsin
	Lincoln P. & P. Co.	Lincoln	Merritton, Ont., Can.
	Lincoln P. & P. Co.	Lybster	Merritton, Ont., Can.
	Lincoln P. & P. Co.	Sulphite	Merritton, Ont., Can.
	Lowe Paper Co.	Ridgefield	New Jersey
	Marinette & Menominee Paper Co.	Menominee	Michigan
	Mead Pulp & Pap. Co.	Peerless	Dayton, O.
	Northwest Paper Co.	Frederick	Brainerd, Minn.
	Pt. Huron Sul. & P. Co.	No. 1	Port Huron, Mich.
	Pt. Huron Sul. & P. Co.	No. 2	Port Huron, Mich.
	Robertson Pap. Box Co.	Montville	Connecticut
	Sorg-Oglesby-Smith Paper Co.	Sorg	Middletown, O.
	Sorg-Oglesby-Smith Paper Co.	Oglesby	Middletown, O.
	Sorg-Oglesby-Smith Paper Co.	Smith	Middletown O.
	Strathmore Paper Co.	No. 1 Woronoco	Massachusetts
	Union B. & P. Corp.	Allen	Hudson Falls, N. Y.
	Union B. & P. Corp.	Fenimore	Hudson Falls, N. Y.
	Union B. & P. Corp.	No. 5	Hudson Falls, N. Y.
	U. S. Gypsum Co.	Gypsum	Ohio
	U. S. Gypsum Co.	Lancaster	Ohio
	Upson Co.	Board	Lockport, N. Y.
	Warren Mfg. Co.	Hughesville	Riegelsville, N. J.
	Warren Mfg. Co.	Riegelsville	New Jersey
	Warren Mfg. Co.	Warren	Riegelsville, N. J.

*Mills that were not in the 1928 Contest.

The Paper Industry 1927 Safety Contest

Accumulative Severity Rates of Mills in Group C, as of December 31, 1928

Participant	Mill	Rate	Participant	Mill	Rate
Kimberly-Clark Corp.	Neenah	0	International Paper Co.	Winnipiseogee	.32
International Paper Co.	Riley	0	Union Bag & Paper Corp.	No. 5	.34
U. S. Gypsum Co.	Gypsum	0	Bergstrom Paper Co.	Neenah	.36
Upson Company	Board	.14	Kimberly-Clark Corp.	Atlas	.50
Gardner & Harvey Co.	No. 3	.15	Lincoln Pulp & Paper Co.	Lybster	.55
International Paper Co.	Webster No. 9	.15	Union Bag & Paper Corp.	Allen	.65
Adams Bag Co.	Chagrin Falls	.17	Lincoln Pulp & Paper Co.	Lincoln	.94
Gardner & Harvey Co.	No. 2	.29	Union Bag & Paper Corp.	Fenimore	1.81
Gardner & Harvey Co.	No. 1	.30	Northwest Paper Co.	Brainerd	2.00
			Lincoln Pulp & Paper Co.	Sulphite	2.40

Group A—Nekoosa-Edwards Paper Co.	Combined Mills	.45	Group B—International Paper Co.	Niagara Falls	.44

Research in Pulp and Paper Work

An Account of the Fundamental Research Studies Initiated by the Technical Society of the Norwegian Paper Industry

NORWAY was among the first of the great pulp and papermaking countries to base the development of the paper industry on fundamental scientific research. The Technical Society of the Paper Industry proposed the foundation of a cellulose research institute ten years ago and under the auspices of the society many remarkable contributions have been made to our knowledge of the action of cooking liquors on wood and of quality and quantity of pulp produced under varying strengths of acids and other cooking liquors, in addition to investigations bearing on the forms of spruce growth most likely to yield the greater quantity of fiber of high quality. The grinding of wood by the mechanical process has also received attention in pursuing varied lines of scientific research looking to the control of manufacturing processes.

The report of the research committee of the Norwegian association, which covers the five years from 1923 to 1928, as submitted by Captain B. A. Melby last November reviews the growth and development of research work in the Norwegian pulp and paper industry from its beginning and is a work of considerable interest and suggestive value.

THE PAPER INDUSTRY is enabled through the kind courtesy of L. J. Dorenfeldt, of Oslo and New York, to publish an English rendering of the report prepared exclusively for our readers.

The Age of Research

The report of the research committee begins with the reproduction of a statement credited to Magnus Christiansen in which it is set forth that "the future of our industry depends on the application of scientific principles in production" and goes on to show that during the last two decades the pulp and paper industry had developed at a very rapid rate, which is reflected in all kinds of industry and in all conditions of life. In every field of endeavor, revolutionary inventions are constantly being made, and these create new needs as well as possibilities for new productions. Old methods and processes disappear; and mills and branches of manufacture which do not keep abreast of the march of progress soon cease to be profitable and eventually go out of existence.

The history of the industry from its very beginning reveals continuous progress, the endeavor of the engineers having always been to make production better and cheaper; the path of the industry is paved with inventions and improvements. But while the development in the last century was mainly of an empirical nature, based on experience, laboriously obtained, it is now chiefly experimental, in which all the means and facilities of modern science are employed. We have not time to wait for the results of experience, but want to get at the heart of things as speedily as possible and the road to that end is through research—industrial-scientific research. Whereas development in the old days went on slowly pace by pace, along the new lines of endeavor it proceeds with express-train speed. While in the old days you could look forward to a rather bright future if only the mill was insured against fire and the like, it is now absolutely necessary to insure as well against loss of competitive ability—and this insurance demands a heavy expenditure for research.

A new era for the industry is proclaimed, with new means and new lines of work. The age of research has begun! The growth of modern industry is now based on scientific research, for research is recognized as the nerve of life in every industry.

Industrial Research Defined—By industrial research today is understood:

(a) Free research on a broad scientific foundation with the purpose of breaking new ground for the industry;

(b) research on concrete, actual problems of immediate import for operation;

(c) scientific control of manufacturing processes.

In order to have research work of this kind done properly, it must be conducted by trained scientists attached to well equipped laboratories.

Developments in Germany and the United States

The paper industry in Germany was the first to realize clearly that modern industrial development must be based on scientific research and Germany in the beginning of this century proceeded to a further extension of her scientific institutes of education and the foundation of research institutes (by both public and private means), with the result that before the world war that country had attained an impressive lead in the industrial world. The United States followed soon and with its unlimited financial resources the progress in this country in all directions of research was so rapid that the United States today must be said to lead the industrial development. According to the register published recently by the National Research Council, there are at present about 1,000 large research laboratories in the United States, and most of the companies contribute a certain percentage of their yearly gross earnings to research.

The other industrial countries have been compelled by competitive influences to follow and change over to work along the new lines according to their resources. In Norway it took a long time before our eyes were opened to the importance and necessity of organized scientific research. The central-committee for scientific co-operation to advance industry and business (later called "The Council for Applied Research") was established in 1918, and the first branch of Norwegian industry to attempt a practical solution of the research question was the paper industry.

Research Committee Organized

The question of establishing an institute of research was discussed publicly for the first time on August 7, 1918, during a general meeting of The Technical Society of the Paper Industry in which Professors Schmidt-Nielsen and Gjessing of the Norwegian Institute of Technology took part. The secretary of the society delivered the opening address on the subject of special education for paper and pulp engineers. He closed his address with a demand for the formation of a paper and cellulose department at the Institute of Technology and the erection of a cellulose research institute. This was received with general approval and a committee was appointed to consider the matter.

On May 22, 1919, the pulp and paper company "A/S Borregard" submitted to The Department of Industrial Supply [presumably a government department corresponding to our War Trade Board—Ed.] an amendment to the by-laws to provide a research institute for the Norwegian paper industry, and two months later the department recommended that appropriations be granted to research laboratories for the promotion of national industrial independence, as well as to industrial research institutes. In November 1919, the department appointed a committee to investigate the question of a research institute for the pulp and paper industry, of which L. J. Dorenfeldt was named chairman.

Mr. Dorenfeldt, who was commissioned by the government to make a study of research institutes in America and Germany, submitted a report in the summer of 1921. He gave it as his conclusion that "for the time being we are not able to establish a central research institute, because we have neither the men nor the money". He suggested the creation at the Technical University of a special division for paper and cellulose and special laboratories so that in course of time men

could be obtained with the necessary qualifications to conduct a research institute.

On the initiative of Mr. Dorenfeldt there was then constituted a Joint Committee of the Paper Industry for Scientific and Individual Research and for Special Education. In addition to Mr. Dorenfeldt the committee comprised the chairmen of the four associations of the paper industry, Alfred Bommen, Magnus Christiansen, H. B. Peterson, and B. Rasmussen. Mr. Peterson was elected chairman and Captain B. A. Melby, secretary. The name of the committee was subsequently changed to that of The Research Committee of the Norwegian Paper Industry.

The first undertaking of the committee was an endeavor to secure funds for organized research work. To that end, application was made to A/S Norsk Varekrigsforsikrings Fond, a foundation created by the insurance company of that name during the world war, with a capital of 3,000,000 kr. The purpose of the foundation is to encourage scientific research, as well as practical and theoretical studies for the benefit of Norwegian industry and commerce. The research committee applied to this foundation for a yearly contribution of 25,000 to 35,000 kr. The result was a grant of 5,000 kr. "to aid the research committee in its techno-scientific research and experimental work." The understanding was that the amount should not be handed over until the committee had formed a definite plan with a full account of the special problems to be made objects for research.

In a conference held March 13, 1923, the committee adopted a research program, suggested by Mr. Peterson as follows:

"Investigation of cooking methods and of acid and liquor compositions for the purpose of a better utilization of the wood."

It was at the same time decided to ask the Technical Society of the Paper Industry to work out the program in detail, and the society appointed for that purpose a working committee composed of Magnus Christiansen, Björn Fougner, Dr. O. M. Halse and W. Sverdrup, and this committee submitted the following:

Proposal for Research Program

Investigation of difference in quality and yield of strong, easy bleaching and bleached sulphite pulps obtained by varying conditions of cooking and strengths of acid.

Investigation of yield and quality of strong and easy bleaching sulphate pulp obtained by cooking in various ways and with alkaline liquors of varying strength.

Investigation of loss of alkali at the several points of the recovery process in the manufacture of sulphate pulp and of the various factors influencing these losses.

The recovery of fiber in the white water of groundwood plants and paper mills.

A critical investigation of the difference between acid made from sulphur and from pyrites.

Through precision measurements with a colorimeter to endeavor to ascertain the quantity of lignin in commercial cellulose.

To find a perfect method for preferably complete recovery of the lime used for causticizing in the manufacture of sulphate pulp.

Program of Research Work Adopted

The Technical Society of the Paper Industry had sometime previously decided to arrange a Technical Society week for August 1923, and the society suggested that the research committee present at this time the research program for discussion. This was done and the program generally approved.

The original intention of the committee was to propose as part of the program an investigation of acidproof lining for cellulose digesters and a conference was held with Prof. V. M. Goldschmidt, chairman of the government's raw material committee, regarding co-operation. Professor Goldschmidt appeared willing to co-operate, but as the experiments would take two or three years at least, and as it was doubtful whether the mineralogical institute, where the operations would have to be performed, possessed the necessary equipment for solving the problem, it was decided not to include these investigations in it.

The program was approved by the research committee and sent to A/S Norsk Varekrigsforsikrings Fond which placed the amount of 5,000 kroner, previously granted, at the disposal of the research committee. Furthermore, the program was submitted to the three other societies of the paper industry, and each of them contributed 800 kroner to defray the expense of the research work.

Following this, the committee decided to engage Dr. Sigurd Samuelsen as research manager from August 15, 1923. The conditions of his appointment included the following provisions: "The research work must be performed partly at the laboratories (private laboratories or those of the university or the Institute of Technology) and partly at the plants and mills. The research committee shall have the right of possession of eventual inventions made by the research manager in connection with the research work".

Directions for research work contained the following stipulations:

(a) The research operations shall, to start with, be devoted to problems which in a reasonably near future can be expected to give practical results of direct importance for operations in the mills.

(b) Effective co-operation and interaction between the research manager and the industrial plants and mills must be aimed at.

(c) The research manager and his staff can, in the fields which are gradually covered by the research work, serve as technical experts for the mills to the extent which may at any time be deemed desirable by the research committee.

To supervise the execution of the research work, the committee appointed a control committee made up of Magnus Christiansen and L. J. Dorenfeldt.

The research manager, Dr. Sigurd Samuelsen, was born in 1890. He passed the examination for an apothecary in 1912 and studied at the University in Oslo during the years 1911, 1912 and 1916. In January 1917, he was engaged as chemist by the Union Company and worked as such partly at the laboratory and partly in the mills. Later he took courses at the University of Darmstadt from 1920 to 1922 and got his doctor's degree at the University in Giessen July 1922 for a thesis entitled, "Uber die Rötung des Sulfitzellstoffs und die Oxydation des Lignins". At the time of his appointment as research manager, he was employed as chemist by the Union Company in Skien.

Doctor Samuelsen had previously visited a number of research institutes abroad and had, after being appointed research manager, the opportunity also to visit and study the Central Laboratory in Helsingfors.

Work of Research Committee 1913-1925

The scope of the research committee's work was outlined as follows:

(a) To systematize and direct the initial scientific research of the paper industry.

(b) To conserve the combined paper industries' interests in relation to special technical education.

The original intention of the committee was to work for chairs of cellulose chemistry and paper and pulp technology at the Institute of Technology, but a closer survey of affairs disclosed that it would not be advisable to start any special course for cellulose chemists and paper engineers at the Institute of Technology unless it was based on a well equipped special institute. Taking it for granted that the government could not, during the economic crisis existing at that time, grant funds for this purpose, the committee decided to defer its educational program till a more favorable opportunity.

Special Investigations

So far as research work was concerned, it proceeded during the first two years under very difficult conditions. Equipment was lacking, and the work had to be done by the research manager alone without the aid of skilled assistants. The work done during these years included the following:

1—Cooking tests of sulphite cellulose.

2—Recovery of fiber in the white water.

3—Cooking tests of sulphate cellulose.

The tests on sulphite cellulose were performed at the mills of the Skotselv Cellulosefabrik and Embretsfos Fabrikker, while the chemical experiments were carried out at the

pharmacological institute of the university. Later, Thunes Mek. Verksted offered its laboratory with apparatus (such as autoclaves for sulphite and sulphate cooking) for use for the research, and the main part of the work was accordingly undertaken there. The purpose of the cooking tests on sulphate cellulose, comprising about eighty cooks, was to obtain results regarding yield and so find the most economical method and time of cooking for strong as well as easy-bleaching cellulose.

Subjects of Research

The cooking tests on sulphate cellulose were not completed until 1926; they comprised 500 cooking and absorption tests, and covered investigations on the following named subjects:

Absorption by the wood of alkaline liquids (volume).

Consumption of alkali (hydroxide, sulphide, and soda) by the wood.

The course of the cooking under varying percentages of alkali and under varying temperature conditions.

Significance of increasing the amount of sulphide in the liquor.

The effect of soda and black liquor on the course of the cook.

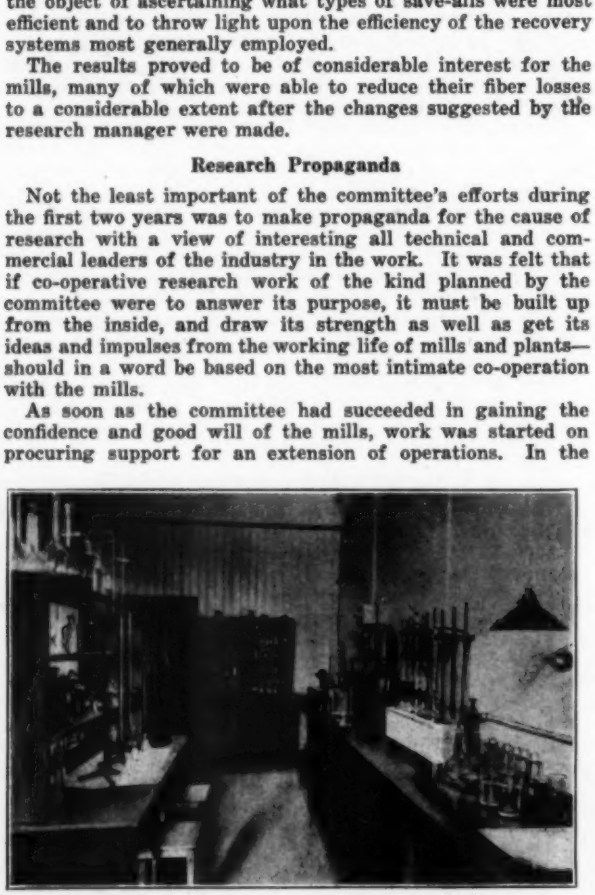
Quality test of paper produced from each cook. The work on recovery of fiber in white water had among other things the object of ascertaining what types of save-alls were most efficient and to throw light upon the efficiency of the recovery systems most generally employed.

The results proved to be of considerable interest for the mills, many of which were able to reduce their fiber losses to a considerable extent after the changes suggested by the research manager were made.

Research Propaganda

Not the least important of the committee's efforts during the first two years was to make propaganda for the cause of research with a view of interesting all technical and commercial leaders of the industry in the work. It was felt that if co-operative research work of the kind planned by the committee were to answer its purpose, it must be built up from the inside, and draw its strength as well as get its ideas and impulses from the working life of mills and plants—should in a word be based on the most intimate co-operation with the mills.

As soon as the committee had succeeded in gaining the confidence and good will of the mills, work was started on procuring support for an extension of operations. In the



Interior of the chemical laboratory at Embretsfos

fall of 1924, there was issued an appeal to the mills for contributions to a future research institute, as also for yearly contributions to the regular research work. In this way there was collected for the research foundation in the first year of operations, 60,000 kroner, an amount which has since grown to about 120,000 kroner. A majority of the mills promised also to contribute a yearly minimum amount of 2 ore (½ cent) per ton of paper and pulp produced.

This result was considered particularly satisfactory in view of the unprosperous state of the paper industry in Norway at that time. Regarded from a financial point of view, the moment for starting the research committee was as unfortunate as could well be chosen, for the industry was then experiencing the most serious economical crisis which it ever encountered; and later it had to cope with difficult sales conditions and an abnormal rise of the krone. The credit for keeping the research work going under these circumstances, must be given to A/S Norsk Varekrigsforsikrings Fond, which not only supplied funds for the start (5,000 kroner in 1923) but later also granted large yearly contributions (respectively kr. 17,500, 15,000, 15,000, 12,500 and 12,000 for the years 1924-1928). Without this assistance the committee would not have been able to realize its research program.

The Experimental Cooking Plant at Embretsfos

As soon as the committee had secured the yearly contributions from the mills, preparations were made for a more rational extension of research work. As the first step in this direction it was decided to build an experimental cooking plant for sulphite cellulose. After having inquired of all the centrally located sulphite mills whether they would be interested in having the plant attached to their mills, it was decided to build it at Embretsfos, where room, available machinery and other conditions were the most favorable. The building was begun May 1925, and completed at the end of October the same year. The plant consists of a 1.5 cubic meter (approx. 1/10 ton) digester with equipment for direct as well as indirect cooking, acid tank, blowpit, pulp chest, riffler, screen and wet machine. Chips, steam and acid are furnished by the mill without charge.

The experimental cooking plant is a 3-story building forming a complete unit within the mills' tanning extract plant. The first floor contains the wet room, the machinery of which is driven by belt from a 20 hp. motor. The digester was erected in a small laboratory on the second floor and on the top floor, where the digester is filled, are located the acid tanks. The arrangement is complete in every detail, practical and convenient. The experimental cooking plant was erected and equipped by the research committee at a cost of only 2,000 kroner.

The test plant was formally opened for work October 27, 1925, with a simple ceremony at Embretsfos, when Otto K. Röcke, chairman of the board of directors of Union Company, handed over the plant to the Research Committee of the Paper Industry.

In order to make the most out of this cooking plant, the research committee decided to let the contributing cellulose mills have the opportunity of renting it during such time as it was not in use by the committee.

Activities of the Research Committee

The committee's research work for the first two years was accomplished under extremely disadvantageous conditions. As stated, the research manager was obliged to work alone without assistance or even necessary equipment. The laboratory conditions were difficult and the cooking of sulphite cellulose had to be undertaken on such a big scale (in a 200-cubic meter digester; approx. 14 tons) that the results could not be exact.

When the experimental plant at Embretsfos was established and the digester adjusted during the spring of 1926, possibilities were created for more truly national research work, and things assumed a different and greater speed. The cooking plant has worked extremely satisfactorily all the time, the total cooks a day numbering about 400. During 1928 the plant was operated night and day. Four men, including two engineers, have been continuously occupied with tests and analyses of cooks.

The object of the investigations was, among other things, to ascertain the conditions that give the best pulp for the many different paper qualities (newsprint, greaseproof, sulphite cap, etc.) In addition, cooking conditions for strong as well as easy bleaching sulphite, and effects of temperature and the importance of lime and acid concentrations have been studied.

Determinations of the hydrogen-ion-concentration of cook-

ing acids have been made. The apparatus necessary for colorimetric as well as electrometric measurements of pH were provided and used for tests. These investigations are being continued.

A Study of Groundwood Pulp

The committee has made extensive investigations on groundwood. The work was devoted first to a study of the formation of fungi in pulp and was done by Dr. Samuelsen in co-operation with the Botanical Institute of the University and under control of Professor Gran. The Norwegian Pulp Company contributed financial support for this work which is now so far advanced that it is possible to tell when and to what extent a groundwood mill is infected. At the same time, means of preventing the formation of fungi in groundwood have been found.

Work was started in 1926 on an investigation of grinding conditions in the manufacture of mechanical pulp. This investigation has been conducted by Per Klem and three assistants who have assisted in checking the results. The program of investigations included: Sharpening of stones with various sharpening rolls, and grinding under varying power and pressure conditions.

Besides investigations of the production under these varying conditions, the quality of the pulp has also been carefully controlled.

Investigations on Spruce

During 1928 investigations on spruce were begun by the committee. The object was to ascertain scientifically what forms of growth would yield the greater quantity and best quality of pulp. For that purpose co-operation was established with The Norwegian Institute of Agriculture. Kaare Nergaard, a graduate in forestry, has conducted these investigations, the purpose of which is to determine the fiber length in loose and compact wood at various heights above the ground and from the pith out to the bark.

These investigations form a good introduction for the studies of wood qualities and their use in the cellulose and pulp industry.

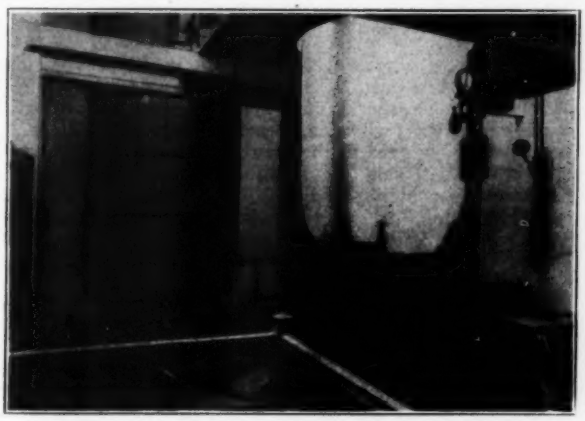
Growing Need for Scientific Control

A growing appreciation of quality of raw materials has made it necessary to provide scientific control of the process as well as of the finished product. In accordance with an arrangement with the Norwegian Cellulose Association, the research committee has started regular examinations of pulp from twelve cellulose mills. These mills twice a week send in pulp for analysis and report as to bleachability, beating quality, strength, rosin and purity. A number of paper mills now also send their products to the committee's new laboratory at Embretsfos to obtain reports on quality and composition. This part of the research work has lately shown a very rapid progress.

Physical testing laboratory at Embretsfos

The Laboratory at Embretsfos

During the committee's first year of operation most of the chemical work and all of the more extensive analyses were performed at outside laboratories, principally at the Pharmacological Institute of the University and at Thunes Mek. Verksted. Operations were hampered by having to confine them to these scattered places and as the number of analyses increased, and particularly as commissions for the mills continued to multiply, the committee was obliged to establish an independent laboratory in connection with its cooking plant. Through the kindness of Embretsfos Fabrikker there was placed at the disposition of the research committee 100 sq. meters of space (1076 sq. ft.) in an old finishing room of the mill. Here the committee established a chemical and physical laboratory. The chemical laboratory was equipped with the necessary apparatus, as for example, water and air baths equipped with sensitive thermostats to keep the temperature constant, as well as apparatus for electrometric determination of pH (Köhler's system). The physical laboratory was equipped with the usual apparatus for strength determinations, such as Schopper's tension-tester, Mullen tester, Elmendorf's tearing tester, as well as scales, microscopes with appropriate cameras, etc., and constant humidity apparatus. There were also provided Heraeu's quartz lamp, Schmidt & Haensch's glarimeter, Zeiss's tintphotometer, Gurley's densometer, Valley folding tester, etc.



Sulphite digester in the research laboratory at Embretsfos

Necessary beating apparatus, such as Lampèn's ball mill, Abbé's pebble mill and a small beating engine, supplemented with a freeness tester, were installed in a special room, which also housed disintegrators, sheet cutters and presses.

The Aims of the Research Committee

The goal of the Research Committee of the Norwegian Paper Industry is a central laboratory in Oslo with sufficient equipment, space and chemists' staff not only to satisfy the paper industry's immediate needs, but also to undertake free research on a wide scientific basis.

Modern development tends toward an ever sharper competition and here as in all contests, one will win and the other will lose. The successful contestant will be the one who undertakes technical research with the greatest zeal and skill. Hence the need for a cellulose research institute.

Du Pont Interests Make Acquisitions

Assumption of control of the United States Rubber Co. by the Du Pont interests was signalized recently when F. B. Davis, Jr., was elected president and chairman of the board. Mr. Davis is president of the Du Pont-Visco-Loid Co., a subsidiary of the E. I. Du Pont de Nemours Co. He succeeds Charles B. Segar as president and chairman of the rubber company.

It is also reported that terms are being considered for the purchase of the Mathieson Alkali Works, New York City by the Du Pont interests.

Wisconsin's Program in Pulp and Paper Education

Report of Work Accomplished in Three-Year Period

By HAROLD G. NOYES

Coordinator for Pulp & Paper & Foreman Training, Wisconsin Vocational Schools

DURING the year 1925, the State Board of Vocational Education made a survey in the Fox River Valley to determine whether any work of an educational nature could be carried on in the vocational schools which would benefit those engaged in the manufacture of pulp and paper.

As a result of this, the vocational schools in the cities of Appleton, Neenah, Menasha, and Kaukauna united in working out a program which ultimately was extended to include the cities of Green Bay, Marinette, Rhinelander, Wausau, Stevens Point, Wisconsin Rapids, and Eau Claire in addition to these four cities.

Inasmuch as this experiment was an undertaking which had never been made elsewhere in the country, the first step was the employment of a man to have charge of this program. The name "coordinator" was applied to this newly created position. The duties of the job were to survey the industry, maintain a contact between the vocational schools and the industry, set up courses of study, recommend to directors and boards of vocational education courses to be offered, organize classes, recommend competent instructors and assume general responsibility for the institution initiating and carrying out of this program. This work is done under the direction of local and state directors.

Harold G. Noyes of Rumford, Maine, who as principal of Rumford Evening School and Director of Part Time Education in the Oxford Paper Company, had had some training and experience in pulp and paper educational work was chosen to inaugurate the program in the Fox River Valley and later to head up the project in the eleven cities composing the circuit. Mr. Noyes started work in Wisconsin on January 1, 1926.

This article or report attempts to give a brief summary of the work attempted, projects conducted, and educational philosophies involved in the light of the experiences of a three-year period ending December 31, 1928.

In the execution of this work several men have contributed much to the program which has been and is at present being conducted. The names of all who have assisted cannot be included in an article of this length, but many names should be and are placed in this report.

School men who have assisted greatly are:

George P. Hambrecht, State Director of Vocational Education.

E. E. Gunn, Jr., Assistant State Director of Vocational Education.

H. C. Thayer, Teacher Trainer, State Board of Vocational Education.

Herb Heilig, Director Appleton Vocational School.

S. E. Crockett, Director Menasha Vocational School.

Carl Christiansen, Director Neenah Vocational School.

A. T. Hudson, Former Director Kaukauna Vocational School.

William T. Sullivan, Director Kaukauna Vocational School.

Harvey G. Stewart, Former Director Green Bay Vocational School.

H. O. Eiken, Director Green Bay Vocational School.

George W. Schefelker, Director Marinette Vocational School.

L. A. Rumsey, Director Rhinelander Vocational School.

E. A. Holm, Director Wausau Vocational School.

R. J. Carver, Director Stevens Point Vocational School.

W. A. Sprise, Director Wisconsin Rapids Vocational School.

H. M. Brook, Director Eau Claire Vocational School.

These men with the respective Boards of Vocational Education through their advice and co-operation made the project possible.

Much credit is due to management and executives in the various pulp and paper mills in the State. Special credit should be given to the following men in assisting in forming courses and establishing classes:

Allen Abrams, Marathon Paper Mills.

Paul Sievert, M. & M. Paper Co.

F. O. Avery, Victory Bag Co.

A. T. Gardner, Combined Locks Paper Co.

Earl McCourt, Consolidated Water Power & Paper Co.

Gilbert Hill, Gilbert Paper Co. and many others.

Several employees of the following organizations have been enrolled in the classes during the last three years: Lakeview Paper Co., Bergstrom Paper Co., Neenah Paper Co., Kimberly-Clark Corp., Whiting Paper Co., Menasha Printing & Carton Co. (Menasha), John Strange Paper Co., Gilbert Paper Co., Wisconsin Tissue Co., Menasha Paper Mills, Fox River Paper Co., Interlake Pulp & Paper Co., Riverside Fiber & Paper Co., Patten Paper Co. Ltd., Appleton Coated Paper Co., Combined Locks Paper Co., Thilmany Pulp & Paper Co., Union Bag & Paper Corp., Hoberg Fiber & Paper Co., Northern Paper Mills, Fort Howard Paper Co., M. & M. Paper Co., Victory Bag Corp., Rhinelander Paper Co., Marathon Paper Mills, Wausau Sulphate & Fiber Co., Menasha Printing & Carton Co. (Wausau), Mosinee Paper Mills Co., Consolidated Water Power & Paper Co., Nekoosa-Edwards Paper Co., Dells Paper & Pulp Co.

Diversified Character of the Industry

As a result of a preliminary survey conducted during the first six months of 1926 in the industry in the cities of Appleton, Neenah, Menasha and Kaukauna, and at later times in other cities, it was found that no definite set-up or "blanket" course of study could be prepared which would fit all cases. The pulp and paper industry presented a different problem than is found in the machinist, carpenter, plumbing and other similar crafts. Definite courses of study may be arranged for the latter. But in a scheme for education in the pulp and paper industry this is not so. There are at least four distinct processes of making pulp. In addition to wood, rag stock, kraft, jute and rope, old papers, and other materials are made into paper. There are scores of kinds and grades of papers. These are sometimes classified in ten general groups each of which may be subdivided into many other classifications.

These are further modified by grades, weights, colors, sizes, etc. Consequently, no attempt was made to build a set of lessons which would fit all the workers in the industry. The program must be built around the specific type of work in which a certain group is engaged.

Again, the use of different machines and attachments give rise to another problem as it created a variation in the lessons organized and the subject matter in a series of lessons built around what was apparently the same topic.

To use a specific illustration found in Appleton. Two methods of making sulphite pulp are used in that city. The direct cooking process is used by one mill while another a short distance away employs the Mitscherlich or indirect process. To give the same instruction to each would be futile. Undoubtedly the general principles and factors are very similar, but in putting on a practical course each group should be treated separately with different subject matter.

Classification of Workers

Surveys of the industry in Wisconsin show that the workers in the pulp and paper industry may be found in jobs which may be classified as: (1) Production; (2) Maintenance; (3) Technical; (4) Service.

These may be further classified in order to establish courses which will benefit each individual most as: (1) Executives (Managerial); (2) Foremen; (3) Skilled workers; (4) Semi-skilled workers; (5) Unskilled or common labor; (6) Part-time boy or girl who attends school at least one day each week.

These terms for the purposes of studying the industry from an educational standpoint were defined thus:

Executives: All positions where men have charge of inaugurating and carrying out a policy over a department or departments. Managers, superintendents, personnel men and safety directors come in this class.

Foremen: The minor executive who occupies the place between the first group and the worker. Many mills employ second hands, sub-foremen, straw bosses and the like and the term "foremen" may be used to include everyone above the worker up to the executive. Each foreman is held responsible for a department or specific operations and processes in a department.

Skilled Workers: This term is hard to define and in summarizing the material obtained in the surveys, the comparative rate of pay received for the job together with the skill and experience necessary to do the job satisfactorily determines the classification of the job as skilled.

Semi-skilled: In this class are put those workers who are just below the rating of a skilled worker, and who some day may reasonably expect to fill jobs classified as skilled.

Unskilled jobs: In this class belongs the jobs generally listed on mill pay rolls as common labor. There is often a "knack" about the job but the training period is generally short.

Part-Time Boy and Girl: This individual is under 18 years of age and attends Vocational School one day a week working the balance of the time in the industry.

A study of the industry showed that in addition to production jobs which are included in the general terms of "pulp and paper making", there are others just as essential if a mill is to turn out the maximum quantity and quality at a minimum of cost.

Maintenance jobs including millwrights, pipe fitters, carpenters, electricians and others must be considered in any training program which is to be of most value to the industry. This is also true of the power plant jobs. Power and power transmission, installation and maintenance of equipment are vital factors in any industrial plant. Service jobs which may include loading, unloading, and transportation are also important.

The modern technical control of processes and methods presents still another problem.

Wisconsin paper men are now recognizing that Safety is an important factor in production. Therefore, this subject received consideration in the curriculum.

Objectives in Study Courses

At this point an attempt was made to establish a set of objectives on which to build courses of study which would have permanent value to all concerned in the undertaking. The selection of these objectives of necessity was guided by facts found in the study of the industry but were influenced by the physical limitations set through lack of equipment, teaching material, trained teachers, class rooms, etc., which have been only partially overcome.

No attempt is made to train a worker to perform a specific job. Rather the philosophy is to give the workers training which will enable them to overcome the lack of knowledge which they may have through lack of interest or lack of previous opportunity. To do this, the subject matter is planned to enable them to do constructive thinking about their jobs and through mastery of a specific job or operation to arrive at a point where potentially, at least, they may fit themselves for opportunities of promotion.

From the viewpoint of the school, the objectives may be said to be two in number, that is, to offer:

1. Adult Educational Work
   - a. Foremanship
   - b. Production courses
   - c. Maintenance
   - d. General Courses as required
   - e. Safety Courses
2. Part-Time
   - a. Trade Finding and Exploratory
   - b. Trade extension
   - c. Part Time Co-operative

These will be defined and described later on.

Attention to physical equipment is next given.

A study of the buildings and equipment showed that most schools were overcrowded. No special room or equipment was available for paper mill classes except at Appleton where the Science Room was converted into a room to be used for pulp and paper classes. At Green Bay and Menasha, rooms were provided for such work part-time. At other times other classes are held in these rooms. Considerable equipment has been installed in the Appleton Vocational School and this school is the only one which can be said to have a place suitable for work as it is hoped may be conducted in the future. In fact, the entire program throughout the State is indebted to Mr. Herb Heilig, Director and the Appleton Board of Vocational Education for the support and co-operation during the evolution of this educational program.

In many cases classes have been held inside the mills. For adult classes this has many advantages, and progressive managers are giving the school authorities many courtesies in rooms, light, heat and equipment without which little could be accomplished.

Returning to the subject of objectives or types of work being offered, it may be well to make a definition of terms in order to understand the plan in its various phases.

For the purpose of making clear the two types of courses, the term adult may be defined as a person over 18 years of age employed in industry full-time, while a part-time student is one employed five days a week and in attendance at school one day weekly. Under Wisconsin's law governing school attendance, a boy or girl from 14 to 16 shall attend school half-time subject of course to certain requirements, while a youth between 16 and 18 shall attend part-time. Many vocational schools have full-time students under 18 years of age and men and women over 18 often attend vocational classes part or even full time.

Further educational terms to describe classes and courses of study set up for pulp and paper mill workers and prospective workers include:

Trade Extension Courses
Trade Preparatory Courses
Trade Finding or Exploratory Courses

Trade Extension is a term given to that type of vocational education which serves a worker who is employed on a job in an industry. Such courses for workers in the pulp and paper industry include material to serve the following types of adult workers in the industry: (1) Foremen; (2) Workers in Production jobs; (3) Maintenance, Power and Service jobs; (4) Safety.

Trade Extension work in science, mathematics, and drawing may be pursued by workers in the industry if the subject matter is directly related to or supplements their daily employment.

Trade preparatory courses in Pulp and Paper are designed to acquaint boys who will enter the industry with raw materials, processes, methods, operations, machinery, and equipment found in the pulp and paper mills of the State. This does not train a boy to do a specific job but he should be a more valuable worker than one who knows nothing of the process of pulp and paper manufacture. At present such courses are offered in the vocational schools of Green Bay, Appleton and Menasha.

The term Trade Finding applies to a course designed for young boys of 14-16 years of age to acquaint them of the possibilities and opportunities of the industry. It is usually given as a part of the course in "Study of Occupations". At

the present time the Appleton Vocational School is the only one offering this work to the half-time boys.

No Part-Time Co-operative courses have been attempted in Wisconsin thus far, although they seem to have greater possibilities than any of the types mentioned. Certain difficulties must be overcome before this type of class may be effectively carried on. A study of this problem is now being made and it is hoped that in the near future several part-time co-operative classes may be conducted in the State.

In this course a boy attends school half-time and is employed in the industry the other half. Generally two boys hold the same job in the mill. While one is at work the other is at school. This scheme enables a young worker to receive specific school training and job training at the period in his life which will enable him to become a valuable worker in industry and help him to advance to a position of responsibility in the concern of which he is an employee.

Methods of Instruction

The next step in establishing vocational work in the pulp and paper industry was a study of methods of instruction. An analysis of the previous school and educational contact of the workers in the mills studied showed that few of the older men had had better than a common school education. Often grades II, III, and IV were as far as they had gone in school. Many had done little reading especially along lines of paper making. Consequently, many of them could not or did not care to do very much reading or writing. Many do not know how to take notes and remember few facts which are brought out in lectures and recitations. In the majority of cases each worker has a wealth of practical experience gained oftentimes in more than one mill or in several departments in the same mill.

Three methods of instruction are employed: (1) Lecture; (2) Recitation, Demonstration, and Discussion; (3) Conference Method.

The first lecture method consists of a group of interested workers assembled at some convenient place where some recognized authority lectures or talks on the subject assigned for the lesson. After the speaker has finished the meeting is thrown open for discussion. Generally, little discussion is carried on either because the group is too large or because the men are loathe to disclose their ideas or question the authority of an "expert". This method does, however, create a certain amount of thinking, and has a tendency to show the student that there is something to be learned about the topic or subject. This method is an excellent one for starting an educational project in a community and may be employed from time to time when processes or steps of interest to a large number are to be taken up.

A very successful course of this type was conducted at Wausau during the winter of 1927-28. The Safety Courses are conducted by this method.

The second method, recitation, is more effective than the first especially for groups on type jobs. Such workers have common interests and may make an intensive study of the problems involved. Demonstrations, cuts, drawings, pictures are invaluable teaching material for this kind of a group.

In the pulp and paper room in the Appleton Vocational School is a projectoscope by means of which charts, cuts, catalog pictures, etc., may be shown on the screen. This saves time in drawing diagrams and figures on the black board and has the distinct advantage that the picture of the equipment looks to the student like the installation which he sees and uses daily on his job at the mill. This is being used advantageously in the course on "Pumps" at Appleton this winter. With the right teacher and the proper teaching material much good may be accomplished by means of this method.

The third method known as the Conference Method, although comparatively new in educational work, is probably the most effective. It may be and is used when groups are taken in individual mills and problems peculiar to jobs or departments are discussed under the leadership of a man trained to teach by this method. By this method the experience and ideas of the workmen and the teacher who is called a leader are pooled and certain preconceived ideas or objectives are "put over" in such a way that constructive and analytical thinking is done by all the members of the group with the result that all the students are enabled to carry away with them concrete facts which might have escaped had they been presented by either of the other two methods. A. W. Bouffard at Green Bay, Appleton and Menasha has been and now is employing this method very successfully. The work in Foremanship in the paper mill cities under the leadership of M. W. Smith is conducted by the Conference Method. At the end of this report is a brief description of this method by Mr. Herb Heilig, who has been trained for this type of work at Fort Collins, Colorado.

Experience is proving that of the three methods the latter is the most effective although the other two must be used when occasion demands.

Preparation of Teaching Material

The next problem considered was the preparation of teaching material. This, as can be seen, was and is an enormous task. So vast is the field to be covered and so much has been written and printed that it will be years, if ever, before the teaching material available can be collected and put in teaching form.

However, in 1927 through the co-operation of the Appleton Vocational School, the State Board of Vocational Education and the pulp and paper mills of the State, a library was established in the Appleton Vocational School which includes all the material it has been possible thus far to obtain. Books trade journals, papers, lessons used in various classes, reports, catalogs, pictures, and other materials are being classified and catalogued for use as source material for the preparation of lessons in the various courses.

Files are being made and material dealing with specific topics is classified so that when a lesson on a certain topic is to be prepared, the instructor draws upon this material to assist him in his task.

While attending classes offered in the various phases of the industry, mill men make use of this library for private reading and study. As time goes on this should be an invaluable asset to the program in Wisconsin.

It has been found that the type of course known as the short unit course is most effective for adult work, and in the future this type will be offered in the evening school classes. A unit course is defined as a series of lessons dealing with specific operations in the industry designed to serve workers in these operations by making available to them the maximum amount of information in the shortest unit of time.

The following short unit courses are available for this type of student at the present time. Others will be arranged as the demand arises.

UNIT I.	Characteristics and Sources of Pulpwood	10 Lessons
UNIT II.	Paper Making Fibers Other than Wood	15 Lessons
UNIT III.	Preparation of Pulpwood	10 Lessons
UNIT IV.	Manufacture of Mechanical Pulp	20 Lessons
UNIT V.	Manufacture of Sulphite Pulp	30 Lessons
UNIT VI.	Manufacture of Soda Pulp	10 Lessons
UNIT VII.	Manufacture of Sulphate Pulp	20 Lessons
UNIT VIII.	Bleach Manufacture and the Bleaching Operation	10 Lessons
UNIT IX.	Size, Sizing, Fillers, Filling and Loading	16 Lessons
UNIT X.	Colors, Pigments, and Coloring Processes	40 Lessons
UNIT XI.	Preparation of Rags and Fibers Other than Rags	10 Lessons
UNIT XII.	Beating	20 Lessons
UNIT XIII.	The Fourdrinier Machine	40 Lessons
UNIT XIV.	The Cylinder Machine	20 Lessons
UNIT XV.	Other Paper Making Machines	10 Lessons
UNIT XVI.	Paper Finishing	20 Lessons
UNIT XVII.	Paper Testing	20 Lessons
UNIT XVIII.	Power and Power Transmission	40 Lessons
UNIT XIX.	Pumps	10 Lessons
UNIT XX.	Paper Mill Chemistry (Elementary)	25 Lessons
UNIT XXI.	Paper Mill Chemistry (Organic)	40 Lessons
UNIT XXII.	Elementary Electricity	40 Lessons
UNIT XXIII.	Advanced Electricity	40 Lessons
UNIT XXIV.	Steam	40 Lessons
UNIT XXV.	Water	10 Lessons
UNIT XXVI.	Felts	10 Lessons
UNIT XXVII.	Wires	10 Lessons
UNIT XXVIII.	Raw Materials of the Industry	10 Lessons
UNIT XXIX.	Paper Testing	10 Lessons

The number of lessons is not arbitrary and may be changed to suit conditions in a particular city or group of students.

Selection of Teachers

The most decisive factor in the successful operation of any educational program for a group of students in industrial or vocational education is the teacher. He must be a man with an exceptional personality. Sufficient practical training and technical knowledge to do the job are not enough. He must know how to teach. Teaching is a trade or art in itself. Many good paper makers and technical men cannot teach the things they know and can do and do well. The problem of getting proper teachers has been one of the hardest encountered thus far in this project. Wisconsin has many good men in the industry who can do an excellent teaching job. But they are working eight or nine hours daily in mills and cannot spare the time and energy necessary to carry on a course over a period of several months. Such men make excellent teachers for short unit courses and have helped immensely in making the lecture courses possible.

Two years ago the cities of Green Bay, Appleton and Menasha as a result of studies made in the industry and schools of those cities united in employing a full-time teacher. He is known as an itinerant paper mill instructor. He spends one day a week at Menasha two at Appleton and two at Green Bay. During the time that Mr. Arthur W. Bouffard has held this position the results have shown that this method is the answer to the teaching problem. He has been able to conduct classes for the half and part-time boys and carry on adult trade extension classes afternoons and evenings. In addition, job analyses of many jobs in several mills have been prepared which serve as a basis in making up series of lessons for work with specific groups.

As a result of the employment of this type of teacher, classes for individual mills may be conducted at the mills in the afternoon as the men come from or go to their jobs. This solution to the teaching problems has also tended to overcome the old time objection that because pulp and paper mills operated on shifts a man could attend class but little. Under this plan classes may be operated at 1:30 P. M., 3.30 P. M., and 7:30 P. M., and men on all three shifts may attend classes if they desire without loss of time or without breaking into their hours of sleep.

During the last three months a study has been made in the cities of Rhinelander, Wausau, Stevens Point, and Wisconsin Rapids and plans are under way to put on an itinerant teacher for pulp and paper classes in these cities.

Thus far very little has been said of the subjects taught. This will be handled by means of a chart at the end of this paper.

Foremanship and Safety Classes

Surveys, conferences with management, and experimental work in 1926 and 1927 showed that there was a great deal to do in the field of Foremanship. After considerable study and thought it was decided to employ a full-time man to do this work. Acordingly Mr. M. W. Smith, formerly foreman conference leader of the State of Kansas was selected to do this work. Mr. Smith started in September with twelve plants in the cities of Eau Claire, Wisconsin Rapids, Stevens Point, Mosinee and Wausau. The classes were held once a week over a twelve week period. Each mill was taken as a separate unit. The foremen met in a room on company premises from one to two hours weekly. The conference method was used and Mr. Smith was able to do some very constructive work with each group.

At present Mr. Smith is conducting foremen conferences in 15 mills in the cities of Marinette, Green Bay, Kaukauna, Appleton, Neenah and Menasha. When this unit is completed, March 1st, 1929, the plan is to finish the paper mills in the Fox River Valley and conduct enough work in nearby cities to round out a full program. Reports from pulp and paper concerns indicate that this project is a success. About 800 foremen will take this type of educational work this year.

Prominent pulp and paper manufacturers realize that Safety work and Accident Prevention is a matter of education. Because of this and in addition to the fact that as one of the factors in production, Safety is essential to every individual in an industrial organization, this type of education has been fostered and promoted. While not limited to this industry alone, the paper industry has taken a prominent and leading part.

Safety Schools at Appleton and Green Bay were so successful in 1927 that several others were started by the vocational schools of the State. This year 13 will be conducted. Wausau, Rhinelander Marinette, Green Bay, Appleton and Menasha are the pulp and paper cities on the list. Harry F. Menzel formerly with the Wisconsin Industrial Commission, was engaged last summer to conduct these schools. The enrollment from the paper industry in these classes will approximate 1100 employees. Nearly every mill in each of these cities is co-operating and have several employees among the enrollments.

The Outlook

Having sketched the factors which have influenced the building of the courses of study and organization of classes in the past it may be well to consider the outlook for the future. Several propositions are under advisement at present, but the things for immediate action seem to be the following:

1. Complete job analyses of the operations of certain processes and methods on which there is a scarcity of material at present. This may in turn be converted into a standard practice for the mills in which this work is done.

Examples of this work:

(1) Analysis of the Green Bay mills manufacturing tissue, towelling and toilet papers.
(2) Analysis of Sulphate process.
(3) Further analyses in mills using rag stock.

This may be done by the men who serve as full-time itinerant instructors.

2. Organization of courses for maintenance and power for concerns in which no work of this type has been offered.
3. Further intensive work in Foremanship.
4. Development of specific short unit courses to cover groups not reached at present.
5. Addition of suitable equipment in several Vocational Schools which at present are inadequately prepared to offer courses.
6. Expansion of program to serve the industry in cities which have no vocational school.

To do these things effectively, all the agencies concerned in the proposition must work together in the intelligent solution of the problems which must be met.

Management of industry, school directors, boards of vocational education, teachers, and employers must co-operate in order to make the project a success.

The paper industry is now reaching the point where technical control, intelligent operation, and a progressive personnel is in a scientific manner securing greater production of maximum quality. New uses for paper are constantly being invented. The search for new raw materials is resulting in amazing discoveries.

Educational work is bound to play an important part in the industrial development of the future.

Proceding from the policy established by the State of Wisconsin regarding the education of industrial workers, the program for the pulp and paper industry has been financed from public funds. The following paragraph by Mr. E. E. Gunn, Jr., Assistant State Director of Vocational Education and Supervisor of Trade and Industry states that "The pulp and paper educational program in Wisconsin has been established and maintained through a co-operative financial arrangement between the Wisconsin State Board of Vocational Education and the local boards of vocational education in cities where courses have been given.

In this arrangement the State Board has, under written contract promoted and fostered this work which is strictly trade extension in character by reimbursing local boards with federal aid to the extend of fifty per cent of the salaries paid for instruction and co-ordination; State aid has also been used for reimbursement so that only a small portion of the in-

structional and co-ordination salaries has been borne directly by the local community.

The local boards in addition to bearing a portion of the salary investment have provided such clerical and other assistance as needed.

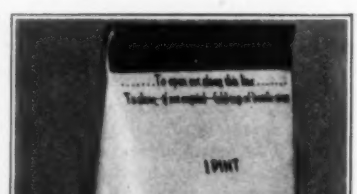
This shows that local and State money, in addition to federal aid is available for this work.

In a brief manner the chief features of the Wisconsin Pulp & Paper development with attention to some of the problems which confront its administration have been touched upon in this article. As these problems are solved and obstacles are overcome the industry in Wisconsin will receive much benefit from the educational work which the vocational schools are offering to workers who derive their living in the various jobs required to produce pulp and paper and paper products.

Manufacture of Paper Milk Bottles

Representative of Sealcone Bottle Gives Paper Salesmen an Inside View of Operations

THE luncheon meeting of the New York division of the Salesmen's Association of the Paper Industry held on Monday, January 28, at the Canadian Club, New York, was fittingly styled a milk bottle luncheon. A representative of the Sealed Containers Corporation, of 347 Madison avenue, New York, was the principal speaker at the luncheon and specimens of the paper containers, as well as types of the paper and board used in their manufacture were exhibited. There was a large attendance of members and visitors who were curious to learn the nature of the paper employed and obtain information concerning the moulding and finishing processes.



Paper milk bottle, called the Sealcone, 8" tall and 3" diameter at base, holds one pint. The straight edge formed at the top by closing the bottle is equal to the diameter of the base

Paper Milk Bottle

Recently the New York newspapers have given much publicity to a new type of milk bottle made by the Sealed Containers Corporation and put into use by the Sheffield Farms Company, Inc. Reports have been circulated quite widely that glass milk bottles are no longer used in New York since the paper container has made its appearance, which is not anywhere near the truth, since it is estimated that 6,000,000 pint bottles of milk are used daily in New York City, exclusive of loose or bulk milk, and the Sheffield plant is at present equipped to turn out only 50,000 paper bottles a day.

How Bottle is Made

J. J. Adams, a representative of the Sealed Containers Corporation, New York, who was introduced by Dr. E. O. Merchant, gave an account of developments in the manufacture of paper bottles by his company. The manufacture of Sealcones, as the containers are called, appears to be a simple operation requiring three sets of machinery, one for die cutting and scoring a sheet, another for impregnating it with paraffin and another for handling, filling and hermetically sealing the container. The pint container is 8 in. tall with a diameter at the base of 3⅛ in. The bottle is not a true cone, the lips at the top being pressed together to form a straight edge equal to the diameter of the base. This is clamped with tin, the strip being impressed at the same time with the date of pasteurizing and filling. The paper which forms the body of the bottle consists of a hard, bleached sulphite pulp, much resembling a Mitscherlich. The disk of heavy paper that forms the bottom of the paper bottle is evidently prepared from jute stock. The paper forming the body of the bottle is twisted and clamped to the disk at the bottom portion in such a way as to form a hermetical seal. Their shape makes it possible to pack a large number of bottles in one container, every other bottle resting either on its head or bottom. The paper sheet forming the bottle is printed in series before being die cut and waxed.

The Sealed Containers Corporation is prepared to install the requisite machinery in dairies, under certain restrictions as to the quality of paper to be used in forming the bottles. There are three sets of apparatus—a forming machine, a paraffining bath, and a machine for filling and sealing. The capacity of such an equipment, Mr. Adams said, was 1,000 bottles an hour.

The Drain on Forests

Some interesting statistics were given by Mr. Adams in reference to fears that had been expressed concerning the destruction of forests that would ensue if paper bottles came into general use. To produce 3,000,000 quart bottles, or 6,000,000 pint bottles, would mean, he said, the consumption of 125 tons of paper, an amount less than was used daily by some of the city newspapers. He reminded his hearers that the paper consumption of the New York Times was 305 tons a day and that of the New York American, 143 tons. He remarked that the elimination of a single newspaper in any city would leave a sufficient surplus of paper for the manufacture of the desired quantity of milk bottles without any slaughter of forest resources. But, as he added, there was no likelihood of an immediate outlet for such great quantities of paper in the manufacture of paper bottles.

Features of the Annual Meeting

As chairman of the Program Committee, Dr. E. O. Merchant presided in the absence of S. C. Knode, head of the New York division. He called attention to the program of the annual meeting and the luncheon which will follow it on Tuesday, February 19. The speaker at the luncheon will be P. H. Whaley, of the Whaley-Eaton Executive Service, Washington, D. C. He is to discuss the tariff situation and business conditions generally. At the business meeting preceding the luncheon, the principal speaker will be Arthur S. Allen who will describe the work that is being done on the standardization of process colors. Mr. Allen has addressed the New York division on the subject of colored inks on previous occasions and he has also been heard by the Technical Association of the Pulp and Paper Industry. He is a recognized authority on the mixing and harmonizing of colors for poster and container work.

The Allis Chalmers Manufacturing Co., Milwaukee, Wis., announces that the manufacture of its Texrope drives for stock has brought on quantity production with a consequent reduction in price. At the present time, this stock has been increased to include all the popular motor speeds and ratings up to 50 hp., with a large choice of driven speeds in a range of ratios from 1:1 up to 7:1. A catalogue has been prepared to make selection of a suitable Texrope drive a simple matter.

The International Paper Company, New York City, is reported to have purchased from the Southern States Lumber Co. 30,000 acres of land in Alabama. This tract will be used for reforestation.

What Management Week Means to the Paper Industry

By FRED E. KUNKEL

CONSIDERING the fact that "Management Week," which is to be held in April, is in every respect a purely local undertaking, at community expense, and voluntary in every respect, it is surprising to note what nation-wide interest this phase of industrial activity has aroused.

Begun in 1922, under the auspices of the American Society of Mechanical Engineers and the Taylor Society, it has gradually grown and spread, until in 1927, the movement included as sponsors also the Society of Industrial Engineers, American Management Association, American Institute of Accountants, National Association of Purchasing Agents, the National Association of Foremen, the National Association of Office Managers, and the Life Office Management Association, and the Department of Commerce.

Because of the fact that R. M. Hudson, chief of the Division of Simplified Practice of the Department of Commerce, has acted as secretary of the National Committee on Management in the past, the belief has spread in many quarters that the department is mainly responsible for the movement. It is not, and this year a change has also taken place in the method of handling the movement due to its very large growth.

Purpose of Management Week

The purpose of Management Week is to hold educational meetings throughout the country of industrial and commercial executives and officials for the purpose of directing the public's attention to various specific problems of management. The movement has assumed such proportions now, although it is only a husky youth in its sixth year, that the idea of a forum or round table discussion of individual problems is rapidly coming to the fore. The most profitable meetings are those held for everybody, with prominent speakers discussing the important phase of a general management theme proposed by the national committee, such as "Management's Part in Maintaining Prosperity," and then encouraging a general discussion by the audience, etc.

A new idea cropping up for Management Week is to break up the groups by trades, paper manufacturers and merchants, hardware merchants, grocers, dry goods merchants, ice cream manufacturers, bakers, etc., getting together and discussing their "management" problems. This is because business interests are varied and what applies to one trade does not necessarily apply to the problems of another, although they have much in common. So that by unifying the groups for a general discussion and then segregating the trades, greater interest can be maintained throughout the country and Management Week made the vehicle for national betterment in commerce and industry.

A map of the United States, drawn up to show where meetings were held and how successful they were, indicates that while meetings were thinly scattered throughout the east and west coast, the intervening portion of the country showed thinly scattered lines, thus indicating that the manufacturing centers principally were interested in management problems, rather than the wholesalers and retailers.

This is not surprising, however, when one considers that the original scheme was hatched out of the fertile brains of industrial executives and manufacturing industries, and "Management Week" is still primarily a manufacturing discussion of how the producer can increase efficiency in plant management, how to cut down waste in distribution, progress in waste elimination, budgetary control of expenditures, and a theme for the future, no doubt, will be "How, When and Where to Buy Raw Materials," or a purchasing problem for industry. The themes covered from 1922 to date have been along manufacturing and industrial lines, because they are the backbone of the nation's business.

Growth and Progress of the Idea

In 1922, when the idea was founded, a number of meetings were held in prominent centers of the country. This number increased gradually, with 80 cities represented in 1925, 115 meetings with 16,000 in attendance, and with 250 meetings in 1926 with an attendance of 30,000. In 1927, 120 cities held meetings with an attendance of about 35,000, and the degree of interest manifested and the high quality of the addresses, made a much better showing than ever before. More meetings were also held in 1927 than ever before, from one to six meetings being held during Management Week in many cities.

Of course, there is no capital behind "Management Week". The meetings are purely of local color and their success depends upon the work of local volunteer committees in every city that holds a public and a general meeting to discuss a theme of local interest and value.

The tendency at recent meetings has been to get away from abstract and more into the discussion of concrete things. In previous years the discussion assumed the shape of generalities, but in recent years speakers have begun to discuss practical examples which came under their attention of certain phases and examples of good management.

Another interesting phase of the evolution of "Management Week" is a general discussion in open forums of local problems and how to overcome them.

It is interesting to note how different cities conduct these meetings, both as to per capita expense and as to the degree of enthusiasm worked up. The expense has varied from as high as $2.50 per capita to $2.50 for all the expenses of the meeting. The success of each venture depends, of course, upon the local chairmen. Some men who are invited to take the lead accept with great gusto, and then fall down completely in putting it over, while live wire leaders carry them through with wonderful success.

The tone of the letters received in the past have been very enthusiastic, even from places where only 30 or 40 men gathered together, as they felt that an excellent ground work had been laid and that next year they would be able to do things in a much bigger way.

How the Movement Is Promoted

Just how does "Management Week" get under way? In previous years the national committee, which starts the ball a-rolling and is composed of one representative of each sponsor organization, selected a topic for the week and acted as a clearing house for local committees.

However, the growth of the movement made it necessary to decentralize as the work was becoming too burdensome on the national committee. This year cities are urged to select their own topics and during some week in April focus attention on the question of management in all possible meetings.

Local chapters of national societies can apply to their own headquarters for assistance in securing speakers on management topics while the unattached local groups can secure this aid from the Management Division of the American Society of Mechanical Engineers, 29 W. 39th St., New York, N. Y.

Local committees are usually formed in various cities for the purpose of giving management week the necessary general momentum in their respective localities.

The incentive to form these local committees usually comes from local groups of the sponsor societies or from local Chambers of Commerce. The advantages are that a large meeting can be arranged and that if desirable the time of visiting speakers can be more profitably used at a number of local group meetings.

The local committee then makes all the financial arrangements for the meeting. All local obligations must be borne

by the committee and its local sponsors. Meeting places can usually be secured without charge from local organizations so that the only expense is that of local publicity and the cost of circulating announcements. Speakers of consequence also usually donate their services.

Organizations which usually back these local committees are chapters or sections of national societies, such as the sponsors of the movement, local chambers of commerce, business men's clubs, executive clubs, engineers clubs, employment managers, purchasing agents, foremen's clubs, sales managers clubs, colleges, universities, schools, etc.

At least one general meeting is held in each city, in which all groups are invited to take active part. In live wire cities there have been as high as 8 meetings a day, or 50 during Management Week, and keen zest and interest is developed in the discussions and open forums.

Topics for Discussion

In view of the voluntary phase of "Management Week" it is astonishing what excellent results are being obtained, and the movement is steadily gaining momentum from year to year as a matter of vital public interest in continued national prosperity and in behalf of better management, cutting costs of production and producing better values for less money for the ultimate consumer. In October 1927, the theme "Management's Part in Maintaining Prosperity," embraced a discussion of:

(1) The wider use of labor-saving machinery;

(2) More general application of modern management methods;

(3) Greater concentration on the mechanics of waste elimination;

(4) More effective co-operation between business men, industrial leaders, engineers and workers;

(5) A better general understanding of business economics.

No meeting was held in 1928 and now the change is made to April, 1929, as this month obviates certain disadvantages found in using the former week in October. So also, it has been decided to devote an entire month to the work this year.

There is also a change in the form of stimulating such Management activities. The organizations supporting Management Week decided that the movement had progressed to a stage where it no longer needs the stimulus of a joint national committee and that it would be advantageous to decentralize the movement by making the interested organizations responsible for aiding their own local groups. This year local groups can apply directly to their own organizations for assistance in arranging local programs as the joint national committee has been disbanded. This large growth made the work of the Joint Committee difficult to handle and the decentralizing of it became advisable.

The month of April was considered the most generally convenient time for Management Meetings throughout the country. During that month, the Management Division of the American Society of Mechanical Engineers is willing to aid in the routing of prominent speakers. However, local sections and other groups are urged not to overlook including Management in their yearly program just because local conditions may not make it possible to have a meeting in April as the Management Division is always willing to give some assistance to a local meeting on Management at any time during the year.

International Paper Company Makes Record in Safety

Report of Company's Accident Experience in 1928

THE safety service of the industrial bureau, manufacturing department of the International Paper Company during 1928, resulted in the best record ever made by this organization. A congratulatory message was issued by John Lundrigan, industrial superintendent, to all who contributed to this result, particularly the employees, management and safety committees at the local plants, who must always be the largest factor in it.

The organization made an actual reduction of 91 accidents which is over twenty-six per cent below the previous year, and a reduction in total days lost of 216.

The accompanying tables are an interesting study of important details and totals, showing efficiency of individual mills, number, causes and character of accidents and resulting lost time.

There were some unusually bright spots in this experience, notably the Riley pulp mill of the Otis Division, Chisholm, Maine, which is now in its third year of operation without a lost time accident. During the last three months of 1928, both Webster and Piercefield mills went through the entire quarterly period without a lost time accident. Piercefield mill was awarded first prize in its class in an accident prevention contest covering New York State sponsored by the Associated Industries.

In presenting this report of accident experience to its mills, the industrial bureau of the International Paper Company reminded that its principal mission and object is avoiding accidental injury. The only sure method of accomplishing this

(See additional tables on page 1952)

ANALYSIS OF ACCIDENT EXPERIENCE YEAR 1928
INTERNATIONAL PAPER COMPANY
MANUFACTURING DEPARTMENT—INDUSTRIAL BUREAU

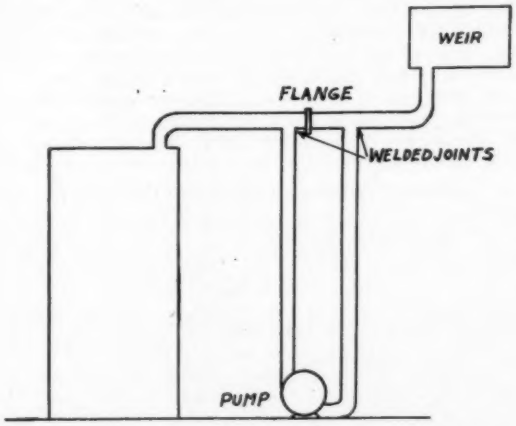
MILLS BY NUMBER	2	3	4	5	6	9	10	13	14	16	17	21	32	Total
OCCUPATIONS														
Wood Handling	0	0	2	0	0	1	2	0	0	6	1	13	7	32
Wood Room	0	0	1	1	0	0	3	2	0	1	0	0	0	8
Ground Wood Dept.	0	0	0	1	0	0	1	1	0	7	0	2	4	16
Sulphite Dept.	0	1	0	0	0	0	0	0	0	0	0	2	0	3
Beaters	3	0	3	0	0	0	1	0	0	0	0	1	1	9
Paper Machines	7	5	2	4	3	2	1	4	1	15	1	14	9	68
Finishing and Paper-Handling	3	0	1	5	4	1	0	2	0	2	0	8	5	31
Indoor Misc.	1	1	0	0	4	0	1	0	0	0	0	2	1	10
Outdoor Misc.	2	4	2	3	0	1	1	2	1	1	0	2	1	20
Power Plant (Steam)	1	1	1	1	0	0	0	0	1	1	0	0	0	6
Power Plant (Elec.)	2	0	0	0	0	0	0	0	0	2	0	1	0	5
Repairs	6	3	3	4	0	0	0	2	4	9	1	6	7	45
Office	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Railroad	0	0	0	0	0	0	0	0	0	0	1	0	0	1
TOTAL	25	15	15	20	11	5	10	13	7	44	4	51	35	255
CAUSES OF ACCIDENTS														
Prime Movers	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Power Trans. App.	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Power Working Mach.	6	5	4	5	1	2	1	4	0	8	1	12	6	55
Manually Oper. Mach.	2	1	0	3	0	0	1	1	0	7	1	0	1	16
Hoisting App.	0	0	0	0	0	0	0	0	1	0	0	4	0	5
Vehicles	0	0	3	1	1	0	0	0	0	2	0	2	3	12
Hot Substances	5	0	0	0	0	0	0	0	1	3	0	2	1	12
Poisonous Substances	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Falls of Persons	2	6	1	3	0	0	1	2	2	6	0	7	3	33
Falling Objects	2	0	1	2	1	0	2	1	1	3	1	7	5	26
Handling Objects	6	3	6	6	8	3	5	4	2	9	1	16	15	84
Misc.	2	0	0	0	0	0	1	1	0	3	0	1	1	9
TOTAL	25	15	15	20	11	5	10	13	7	44	4	51	35	255
DESCRIPTION OF INJURY														
Amputations	0	1	2	0	1	0	0	1	0	2	2	1	1	11
Cuts, Bruises and Lac.	11	5	7	7	3	4	3	5	0	18	2	23	14	102
Breaks and Fractures	0	4	2	5	2	0	3	2	3	5	0	13	3	42
Sprains and Strains	4	3	2	5	3	0	3	2	1	11	0	5	9	48
Burns and Scalds	5	1	1	0	0	0	0	0	1	0	0	3	1	12
Eyes	1	0	0	0	0	0	1	0	0	0	0	1	1	4
Hernia and Rupture	1	1	1	1	2	0	0	0	0	6	0	2	0	14
Infection	2	0	0	2	0	1	0	3	1	2	0	2	6	19
Fatal	1	0	0	0	0	0	0	0	1	0	0	1	0	3
Misc.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	25	15	15	20	11	5	10	13	7	44	4	51	35	255

Practical Helps for the Mill Man

Welding Outfit Saves Time

THE master mechanic of a very large board mill has found that the use of a welding outfit in the plant often proves a means of saving money as well as time. Recently, while trying out a new machine, the application of welding equipment to work about the plant was emphatically demonstrated. The new machine installation necessitated a long line of 10" pipe dropping vertically for a distance of 6' or 7' from a weir and then traveling horizontally for about 20' before taking another short vertical drop into the machine being tested.

In making the test run, it was decided that the pressure developed by the drop of the material from the weir through the pipe to the machine was not sufficient for satisfactory operation. Rather than take down the pipe already in place and to reinstall along with a centrifugal pump to develop the necessary head, it was determined to use the welding equipment. The horizontal length of pipe was first cut in two at a convenient point and a circular plate of suitable diameter to close up the pipe was produced by cutting from flat steel plate. The circular plate was inserted into the slot left by the cutting of the horizontal section of pipe and completely welded into position thus forming a blind end in the horizontal pipe. Then at points convenient to the flange and in the bottom of the horizontal section of pipe two circular openings of suitable diameter were cut—one opening on either side of the flange. A vertical section of pipe was dropped from each of these openings, the vertical pipes being completely

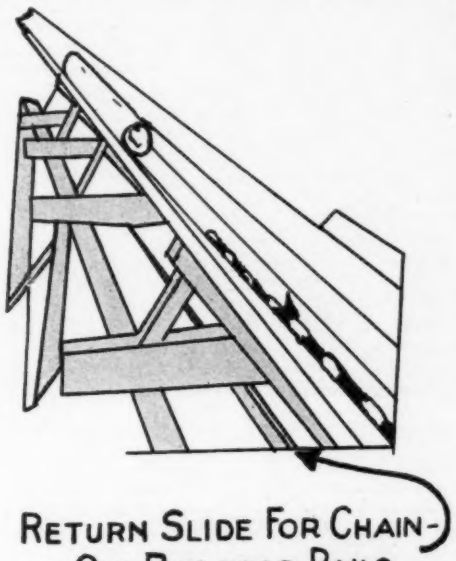


welded into position in the horizontal section of pipe to a centrifugal pump located conveniently on the floor below.

As soon as the pump connections to the inlet and discharge openings of the unit were made, the piping arrangement thus developed permitted the material from the weir to be pumped into the machine on test against suitable head. The use of the welding outfit eliminated the necessity of taking down the piping installation already made as well as the necessity of cutting and threading short sections of pipe to meet the new condition. No elbows or tees were required to connect the horizontal pipe with the vertical sections to the pump. With such an outfit, according to the master mechanic, less pipe fittings are carried in stock and time is saved in making installations. Many other uses for the equipment have also been developed in the maintenance work about the plant.

Novel Use of Old Railroad Rails

LOG haul-ups or other conveyors for handling wood often make use of several different designs of chain and attachments or spurs. The spacing of the spurs upon equipment of this kind varies from about 4 feet to 8 or even 10 feet. Since such a conveyor is designed to meet particular conditions in each plant, it frequently happens that the return chain of the conveyor must be returned to the tail shaft by passing over idler sprockets and wooden slides faced



with metal strips. The metal strips are commonly attached to the wooden slides with heavy screws. The heads of the screws either wear down or the screws loosen. In this way the metal strips become loose and are damaged by the conveyor chain. To overcome the damaging of metal strips and the necessity of shutting down on such occasions, it has been suggested that light gauge railroad rails, which are worn to a point unsafe for regular service, be substituted for the wooden slide with metal facing. In this case, the sections of rail could be coupled together with pieces of flat iron.

The layout of such a system would naturally depend upon the type of chain used on the conveyor. If there were no projections between the sides of the spurs, a single track could be laid to support any one chain of a conveyor on its return travel in such a way that the spur points would serve as a guide in keeping the chain on the track. With a projection on the center of the spurs it would be necessary to use two rails, one on each side of the projection, but with the chain guided by the outside spur points as in the preceding case. If ordinary link chain equipped with spurs were used, a double track should be laid so that the vertical links of the chain would be held upright, and the horizontal links would run with their sides resting upon the face of the rails. The sides of the spurs would extend down beside the rails as in the other cases. Old rails would easily lend themselves to use in practically any type of conveyor construction designed to handle logs and as employed in the wood pulp industry, and would make for an installation that would last indefinitely.

Dr. Erich Opferman, who has for the past four years served as chief editor of our Berlin contemporary, **Der Papierfabrikant**, has retired. His place will be taken by Dr. B. Possanner von Ehrenthal, of Coethen, Anhalt, who has an international reputation as a contributor to paper industry periodicals.

Union Bag's New Sulphate Pulp Mill

Wood Supply from Sawmill Waste in Modern Equipped Plant at Tacoma, Washington

THE Union Bag and Paper Corporation after careful consideration of northwestern timber reserves, facilities for shipping by both rail and water, and the growing importance of wholesale and retail markets of the Pacific Coast and mountain states, decided to locate a sulphate pulp mill of 120 ton daily capacity at Tacoma, Washington and a bag factory at Vancouver, Washington.

Confining the data to the development of the pulp mill project, a site on the tideflats of Tacoma's water frontage—where the Puyall River empties into Commencement Bay of Puget Sound—was chosen. On this site, where both rail and water transportation are readily available, was erected a 120 ton sulphate pulp mill by the Union Bag and Paper Power Corporation, a subsidiary of the Union Bag and Paper Corporation. The plant was placed in operation shortly after January 1, 1929.

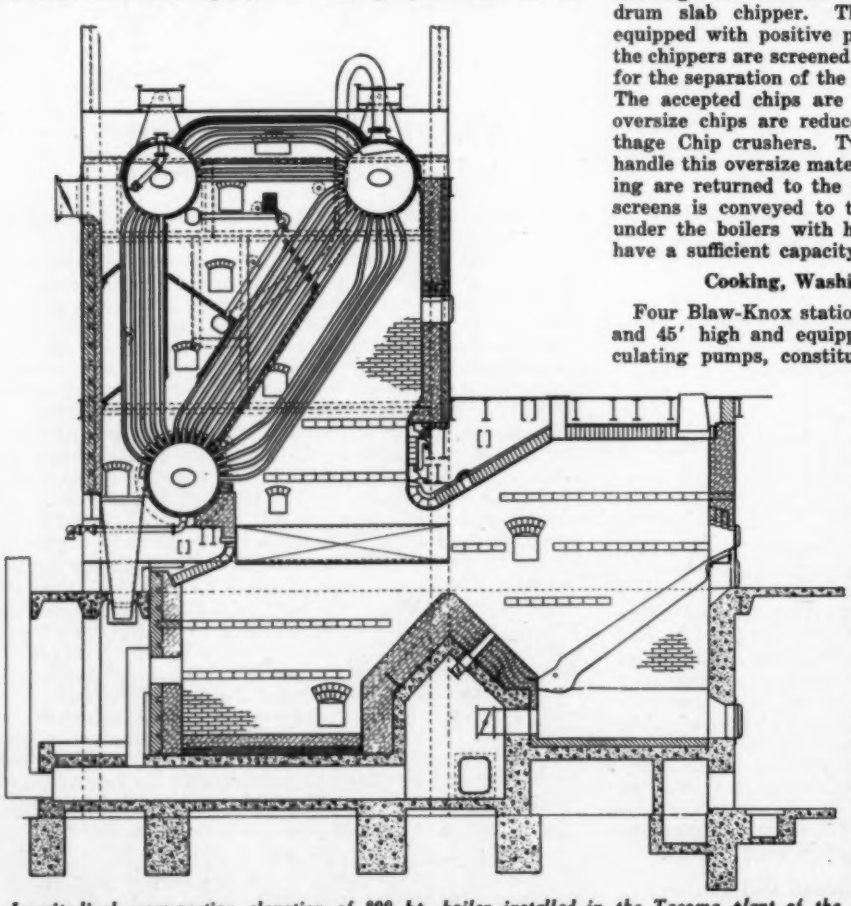
Transportation facilities developed at the plant permit ocean going steamers to dock at the mill, and a system of tracks connect directly with those of the Chicago, Milwaukee, St. Paul and Pacific Railway Company. In addition, the mill is connected by rail with the Northern Pacific Railway, Oregon-Washington R. R. & Navigation Co., Great Northern Railway and the Puget Sound Electric Railroad.

The wood supply will be obtained from the St. Paul and Tacoma Lumber Company. This company in order to dispose of its surplus wood profitably has erected adjacent to the pulp mill a modern and efficient all-electric sawmill of approximately 250,000 board feet capacity per eight hours. Waste wood from this sawmill is conveyed directly to the wood room of the pulp mill.

Arrangements have also been made for the delivery of mill waste produced in two other large sawmills of the same company. These mills are likewise located on adjacent property. A slasher plant has been provided for cutting logs into suitable lengths, and provision has been made for handling the logs as well as woods refuse, culled lumber, and other forms of waste wood.

Steel, brick and reinforced concrete have been used in the construction of the pulp mill buildings. Temporary walls, where provisions have been made for future extensions, have been erected of Robertson's Sheet Metal Siding. The equipment for the plant includes some of the latest ideas in pulp mill machinery. In design and construction, everything has been done to make it a most modern and efficient plant.

In operation, the mill waste entering the wood room passes, when necessary, through two 10′ x 30′ American Barking Drums, where the bark is removed and the wood thoroughly washed. After the barking and washing operation, the wood is fed into the chippers. Two chippers have been installed—a Carthage 110″ cast steel disc chipper and an Allis-Chalmers drum slab chipper. The Allis-Chalmers slab chipper is equipped with positive power feed. The chips produced by the chippers are screened on six Sturtevant Vibro chip screens for the separation of the small, acceptable, and oversize chips. The accepted chips are passed to the chip bins, while the oversize chips are reduced in size by passing through Carthage Chip crushers. Two crushers have been installed to handle this oversize material. The oversize chips after crushing are returned to the screens while the sawdust from the screens is conveyed to the boiler house where it is burned under the boilers with hogged fuel. The chip storage bins have a sufficient capacity to hold thirty-six hours' supply.



Longitudinal cross-section elevation of 800 hp. boiler installed in the Tacoma plant of the Union Bag & Paper Power Corp.

Cooking, Washing and Drying Operations

Four Blaw-Knox stationary digesters, each 10′ in diameter and 45′ high and equipped with Morterud heaters and circulating pumps, constitutes the digester installation. The installation has been made in such a way that all cooking operations, including filling, steaming and blowing are performed from one floor. The digesters are equipped with Yarway steel blow valves, which it is understood have been adapted recently to this purpose. The Morterud system of cooking obviates dilution of the cooking liquor which takes place when steam is admitted directly into the charge.

With the cooking operation completed, the digesters are blown into a cylindrical blow tank, 20′ in diameter and 35′ high. From this tank the stock is pumped to the washers. Exhaust steam and non-condensable gases pass through a cyclone trap and into two Wheeler condensers. Each of the condensers has a cooling surface of 3200 square feet. The steam in passing through the condensers is condensed and discharged to the sewer,

while the non-condensable gases are pumped to Wagner furnaces where they are completely burned.

Pulp washing is accomplished on a two-stage vacuum filter system. The primary or first stage washing is done on three 6′ x 10′ Oliver brown stock washers. In this washing, most of the black liquor is removed from the pulp. The remainder of the liquor is removed on the secondary washers which consist of two 8′ x 10′ Oliver filters. White water from the wet machines serve as the washing medium thus making the secondary filters serve also as save-alls.

Two 120″ Kamyr wet machines, each capable of handling 90 tons of pulp per 24 hours, constitute the installation of equipment for thickening the pulp in the form of a sheet approximately 55 per cent air-dry. This sheet pulp is then passed through shredders and the shredded stock into four eight-section Sargent dryers. The shredded stock is dried at comparatively low temperature with recirculated warm air in the dryers. The pulp discharged from the dryers is baled in Hesse-Ersted Continuous Pulp Balers, of which there are four, before it is ready for shipment.

Recovery Process

The black liquor is concentrated to approximately 35° Be. hot in a quadruple effect Swenson evaporator. The evaporator has a total heating surface of 28,000 square feet and a high-pressure rapid-circulation concentrator of 800 square feet. The non-condensable gases from the vacuum pump of the evaporator are pumped to the Wagner furnaces and burned with those from the digesters.

The Wagner recovery furnace installation is a deviation from older practice in the recovery of alkali in the soda and sulphate processes where rotaries and smelters are employed. Five Wagner furnaces, each connected to a 500 hp. Erie City Waste Boiler constitutes the installation. Each furnace is a complete unit with boiler, scrubber, and auxiliary equipment such as fans, pumps, etc. The furnaces are lined with soapstone, and the boilers are specially designed for this service. In the operation of the furnaces the concentrated black liquor is sprayed, while the salt cake in fed at a constant, determined rate into the furnaces where the chemicals are recovered and the hot gases are permitted to pass through the boilers and scrubber equipment to the stack.

The causticizing equipment consists of a complete Dorrco system of a continuous lime slacker, classifier, three agitators, four clarifiers and two internal drum lime sludge filters as well as a Vulcan 7′ x 120′ rotary lime kiln.

The green liquor from the recovery room is pumped to a 30′ Dorrco clarifier from which the clean liquor is pumped to the causticizing system. The settled green liquor sludge is pumped to another 30′ clarifier where it is washed with water and then discharged to the sewer. Causticizing is accomplished in the agitators to which the green liquor and slaked lime are delivered. The causticized mixture passes to a clarifier from which the white liquor goes to storage. The settled slime sludge is pumped to another clarifier where it is washed with water and then concentrated on the lime sludge filters. The lime sludge cake is burned in the rotary kiln and emerges from the kiln as burned lime ready for reuse.

The Boiler Plant

In the boiler house are installed two 800 hp. Erie City three-drum boilers, two Ljungstrom preheaters, Permutit water softening system and a Cochrane feed water heater.

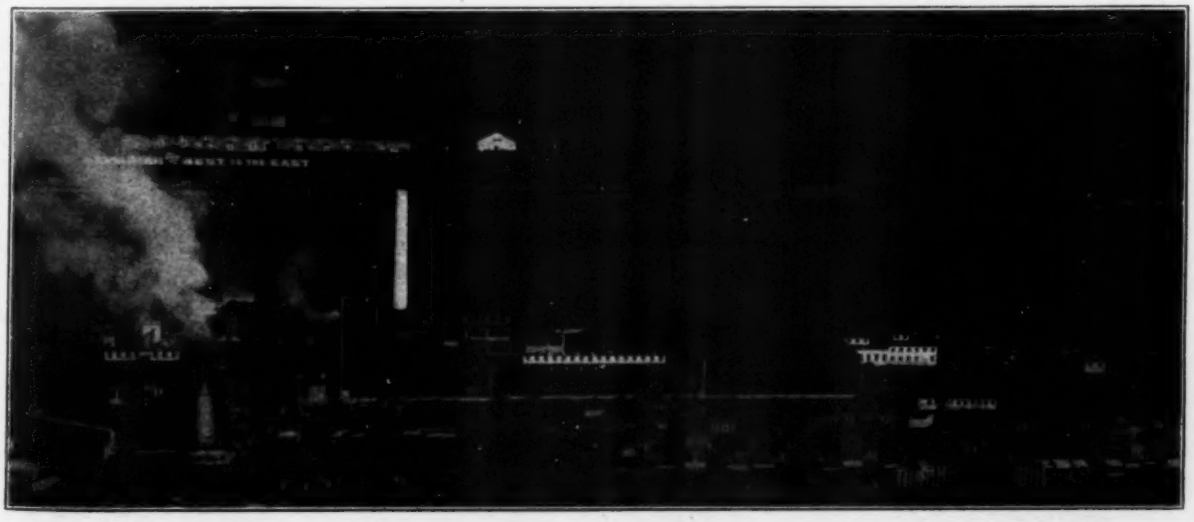
Pulp Drying Machine in Union Bag's Tacoma Mill

The boilers are equipped for burning either hogged fuel or oil, while the air furnished to the boilers is first passed through the preheaters. These boilers, together with the waste heat boilers on the Wagner furnaces, furnish steam for cooking, drying, and evaporating at 150 pounds pressure per square inch.

Water and power are furnished by the City of Tacoma. A 150,000 gallon steel tank 175 feet high has been erected for fire protection purposes. The plant has also been equipped with an up-to-date machine shop to handle repair and maintenance work.

Crane Company of Chicago furnished all valves and fittings. Johns-Manville Company supplied the pipe covering.

The plans for the plant were drawn by Hardy S. Ferguson of New York who is internationally known as a designer of



Airplane view of new sulphate pulp mill, Union Bag and Paper Power Corporation, Tacoma, Wash.

pulp and paper mill properties. L. R. Wood, the corporation's resident engineer at Tacoma, gave personal supervision to the work throughout the construction period. Albertson, Cornell Bros. and Walsh, Inc., of Tacoma, were the general contractors on the project.

W. W. Griffith, formerly connected with the Chicago office of the Union Bag and Paper Co., has been located at Tacoma for over a year as the corporation's Pacific Coast resident business manager. Josef Hedin, widely recognized as a pulp and paper expert, has been appointed general superintendent, while Dennis Cousins is serving in the capacity of assistant general superintendent.

The development of this plant on the Pacific Coast, as well as the bag plant mentioned in the early part of the article, is indicative of the recognition of the Northwest's industrial future, and speaks for the enterprise of the City of Tacoma, the St. Paul and Tacoma Lumber Company, and the Union Bag and Paper Corporation.

Chlorine Plant on Pacific Coast

Operations Begun in Newly Constructed Plant of Hooker Electrochemical Company at Tacoma, Washington

THE Hooker Electrochemical Company has just completed and put in operation at Tacoma, Washington, one of the largest chemical plants in the West for the major production of caustic soda and liquid chlorine. The site comprises about twenty acres, part of which was previously used by the Foundation Company, located on the east of Alexander Avenue and lying between this street and Hylebos Waterway. Every detail of the new plant has been studied with extreme care in respect to a pleasing architectural appearance consistent with an operation of this kind and that the manufacture of the products may be carried on with utmost economy, utilizing apparatus of the most modern type and of the maximum efficiency.

The choice of this particular location in Tacoma was undoubtedly due to favorable land prices, convenient shipping facilities, satisfactory power supply and rates and other similar items. Inasmuch as one of the main products, liquid chlorine, is mainly consumed by the manufacturers of pulp and paper, a location which was central from a distributing point of view became essential. The other main product, caustic soda, finds a large part of its outlet in shipments to foreign countries and to California, thereby emphasizing the necessity for favorable shipping conditions by water.

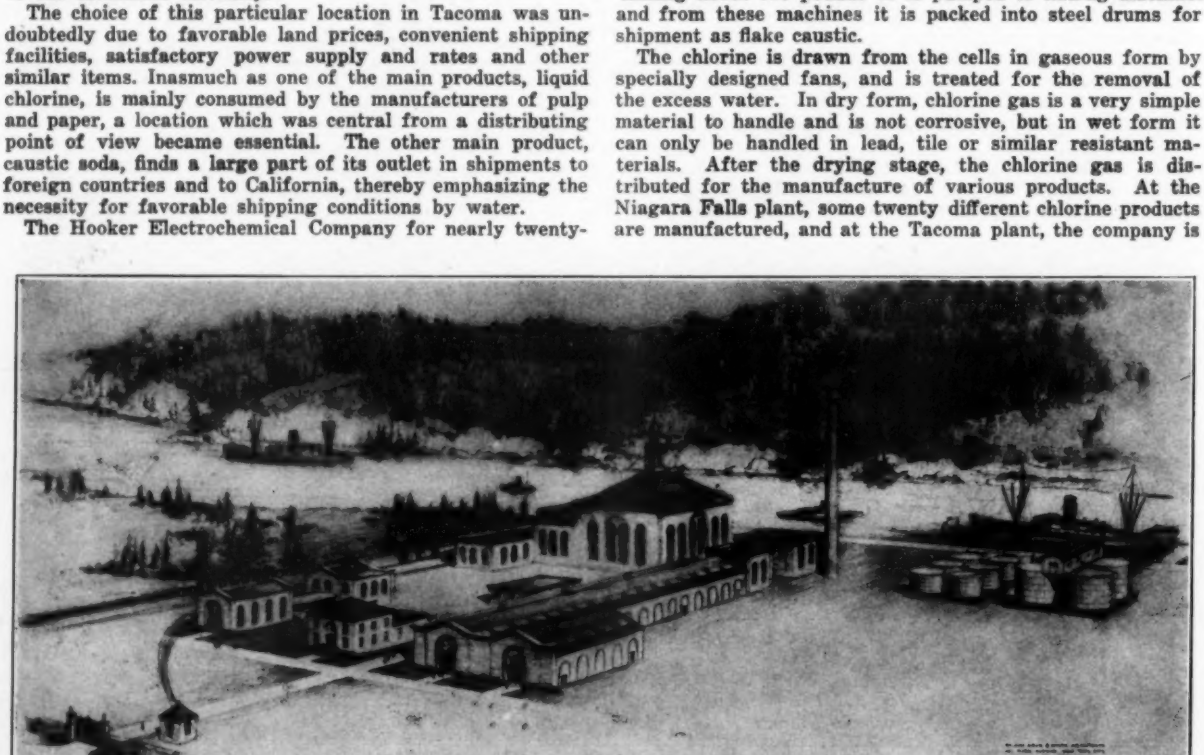
The Hooker Electrochemical Company for nearly twenty-five years has been operating a plant at Niagara Falls, New York. Starting there on a small scale, the plant has gradually become enlarged until it is now reported to be one of the largest chlorine producers in the United States. The expert knowledge which has been acquired in this specialized line at Niagara Falls has been applied to the design of the Tacoma plant.

Manufacturing Process

The process of manufacture in the Hooker plants is fundamentally based upon the Townsend Cell in which electric current is passed through a brine solution made from common salt (NaCl) thereby breaking up the salt into its two elements sodium (Na) and chlorine (Cl). The patents covering the Townsend Cell are owned both in the United States and abroad by the company and are operated on a large scale at Niagara Falls and in Japan. The cell itself is high in efficiency, economical in power consumption and built in units of such large size as to render the attendance small and the floor space a minimum per ton of output. The Townsend Cells can be run efficiently at over 5000 amperes.

The sodium flows out of the cell in the form of a liquid containing about 14 per cent of caustic soda and with excesses of water and salt. This caustic liquor passes to storage tanks where it is held pending its purification and treatment to put it into marketable form. The first step involves the removal of water by vacuum evaporation which is carried on in a set of Swenson evaporators where, as the strength of the solution increases, a large part of the salt is dropped out. At the outlet of the final vacuum pan, the liquor contains about fifty per cent of caustic soda, a small amount of salt mostly in suspension and excess water. After this liquid is treated for the removal of most of the remaining salt, it is in form for shipment as liquid caustic. For those customers who desire caustic soda in the solid form, the concentrated liquor is run into cast iron pots containing nearly 20 tons of finished product and fired by oil in which the final traces of water are removed until the material reaches the fusion stage. It is then either pumped into steel drums containing about 700 pounds or is pumped to flaking machines and from these machines it is packed into steel drums for shipment as flake caustic.

The chlorine is drawn from the cells in gaseous form by specially designed fans, and is treated for the removal of the excess water. In dry form, chlorine gas is a very simple material to handle and is not corrosive, but in wet form it can only be handled in lead, tile or similar resistant materials. After the drying stage, the chlorine gas is distributed for the manufacture of various products. At the Niagara Falls plant, some twenty different chlorine products are manufactured, and at the Tacoma plant, the company is



Tacoma Plant—Hooker Electrochemical Company (from architect's drawing)

prepared to produce these various products as the demand in the West may warrant.

Most of the chlorine from the Tacoma plant at the start will be shipped in the form of liquid chlorine which is made by a process of compression and refrigeration. Special compressors are used for the compression operation and the refrigeration is supplied from CO_2 machines. Chlorine will remain in liquid form as long as it is held under pressure, but when the pressure is released, the material reverts to the gaseous condition. Consequently, shipments of liquid chlorine are made in specially designed containers varying in size from 100 pounds to 60,000 pounds. The standard sizes are those of 100 pounds and 150 pounds known as cylinders; the one-ton drum which is shipped in lots of fifteen on specially constructed railroad frames; and the tank cars of which there are two sizes in common use, one holding 32,000 pounds and the other holding 60,000 pounds.

The two main raw materials for the manufacture of caustic soda and chlorine gas are electric power and salt. The electric power is supplied under a contract with the department of public utilities of the City of Tacoma. There are many sources for the salt required in the operation of the plant, among which may be mentioned New York State, Louisiana, California, Spain, Italy and China. In view of the fact that the company's plant is located on deep water, there being thirty-five feet at the dock at low tide, it is possible to receive shipments by ocean going vessels as well as by those of the coastwise type.

The plant has an initial capacity of thirty tons of 76 per cent caustic soda per day and twenty-six tons of cell chlorine.

The president of the Hooker Electrochemical Company is Mr. Elon H. Hooker, who has occupied this position continuously since the company was first organized. The general offices are at 25 Pine Street, New York City. Sales supervision is in the hands of Mr. Harry M. Hooker, vice president of the company, and Mr. A. H. Hooker Jr. is sales manager for the Tacoma plant.

January Meeting Paperboard Industries Ass'n

The meeting of the Paperboard Industries Association at the Palmer House, Chicago, January 23 and 24, 1929 was the first meeting of the year, also the first to be presided over by the new officers elected at the annual meeting in November.

Folding Box Group—The meeting of this group was held on the morning of the 23rd, and presided over by H. H. Stonebarger of the Globe Folding Box Company, Cincinnati, Ohio. This meeting was unusually well attended, and the members participated actively in a discussion of the subjects considered. A detailed report was submitted showing progress made in inaugurating and extending the use of folding boxes for the packaging of a number of articles, which may advantageously be packaged in folding cartons. Grafton Whiting, the association's statistician, reported with respect to: uniform depreciation rates, census of the folding box industry, survey of compensation insurance rates, and also gave a report on the Cost Division meeting held at Cleveland last November. Vice president Stonebarger submitted an interesting and constructive report, dealing with the problems of the folding box industry, and stressed the need for co-operation on the part of every factor in the industry. This report was followed with an interesting discussion, it being the sense of the meeting that regular attendance of all members at the meetings and participation therein, would serve to lift the industry to a higher plane.

Paperboard Group—This group held its meeting the afternoon of the 23rd, at which the vice president, Hugh Strange, of the John Strange Paper Co., Menasha, Wis., presided. Mr. Whiting, statistician, reported on such subjects as: Government census of the paperboard industry; census of the industry to be taken by the association; forecast regarding freight car requirements; waste paper and kraft pulp consumption per ton of board. Mr. Strange announced that a letter had been received from the Secretary of Labor, calling a meeting of the paperboard industry under the auspices of the Department of Labor in the Assembly Hall, Department of Interior Building, Washington, D. C., Tuesday morning, February 5, 1929. It was stated that invitations to attend this meeting had been mailed to every paperboard manufacturer in the United States. Mr. Strange urged that every company be represented at this meeting by an executive with power to act.

General Manager Browder reported on the proposal known as Subject No. 42, brought before the Consolidated Freight Classification Committee by the Minnesota & Ontario Paper Company, International Falls. Minn. This proposal contemplated a number of changes in specifications for corrugated and solid fibre boxes. A large number of shippers whose present packages would be affected by such a change, appeared at the hearings in New York on January 15 and Chicago, January 23, making vigorous protests against this proposal. Judging from the volume of protests and the general attitude of the Freight Classification Committee, it is believed the proposal will be denied.

Container Group—H. C. Krannert, of the Inland Box Corp., Indianapolis, Ind., group vice president, presided at the meeting of this group, which was held on the morning of the 24th. General Manager Browder submitted a comprehensive report on container subjects. The topic which evoked lengthy discussion was that of inspection service. It was accorded that the present inspection campaign should be carried on actively at least until the end of March. Mr. Whiting, statistician, reported on: compensation insurance, uniform rates of depreciation, cost survey, and census of the container industry. The standardization committee submitted a report which was given to the meeting by its chairman, F. J. Kress, of the F. J. Kress Box Co., Pittsburgh, Pa. Mr. Kress gave details of the proposal suggested to the Consolidated Freight Classification Committee by the Minnesota & Ontario Paper Company.

General Meeting—All groups joined in the general meeting which was held on the afternoon of January 24, and presided over by the president, J. J. Brossard of the Fort Wayne Corrugated Paper Co., Fort Wayne, Ind. The executive committee submitted a report containing a resumé of subjects considered at its meeting held January 22, together with its recommendations. This report covered such items as finances, special inspection service and tariff matters. The report was accepted. President Brossard requested that a brief report of subjects considered and action taken by the individual groups be presented at this meeting, which request brought a hearty response.

General Manager Browder submitted a concise report of the principal activities of the association since the last meeting, after which J. B. Fenton, chairman of the central plan committee reported on the progress of the committee to develop a plan for organization and operation, to function after the trade practice resolutions have been formally acted upon by the Federal Trade Commission. Mr. Fenton reported that while a number of replies had been received to letters sent out asking for suggestions regarding organization, it is desired to have a larger number of suggestions before the committee for consideration at its next meeting.

Announcement was made that each of the three groups of the association had adopted uniform size of skid platforms in accordance with Simplified Practice Recommendation R-95-28 as made by the U. S. Department of Commerce.

The meeting closed with the appointment of standing committees to serve during the year 1929. The next meeting will be held at the Commodore Hotel, New York City, March 20 and 21, 1929. Meetings of the executive committee and standing committees will be held in New York City, March 19.

General Refractories Co., Philadelphia, has recently opened a San Francisco office which is located at 742 Russ Building. This office is in charge of W. E. Dornbach, who for several years has been associated with the company's office in Philadelphia and prior to that was manager of its Baltimore works.

The General Electric Company, Schenectady, N. Y., has announced that orders received during the year 1928 amounted to $348,848,512 compared with $309,784,623 for 1927, an increase of 13 per cent.

Program of 52nd Annual Convention of American Paper and Pulp Association, Waldorf-Astoria Hotel, New York City

MONDAY, FEBRUARY 18

AFTERNOON

2:00 Conference Committees .....Room 112
Tissue Paper Manufacturers Association.
National Paper Trade Association.
2:30 Southern Kraft Manufacturers Association .....Room 151

TUESDAY, FEBRUARY 19

FORENOON

9:30 Gummed Industries Association ....Room 109
9:30 Cost Association of the Paper Industry .....Room 115
9:30 Technical Association—(*General Session*) Myrtle Room
9:30 American Waxed Paper Association..Room 112
10:00 Paper Twine Spinners.....Room 114
10:00 Tissue Paper Manufacturers Association .....East Room
10:30 Converting Paper Mills Association..Room 151
10:30 Salesmen's Association of the Paper Industry .....Astor Gallery

AFTERNOON

1:00 American Waxed Paper Association, *Luncheon* .....Room 112
1:00 Salesmen's Association of the Paper Industry, *Luncheon* .....Sun Parlor
2:00 Gummed Industries Association.....Room 109
2:00 Cost Association of the Paper Industry .....Room 115
2:00 Technical Association (*Cellulose*)..East Room
2:00 Technical Association (*Heat, Light and Power*).....Myrtle Room
2:00 Technical Association (*Paperboard*).Room 151
2:00 National Sulphite Paper Mfrs. Assn. .....Tea Lounge
2:30 Cover Paper Manufacturers Association .....Room 110
2:30 United States Pulp Producers Association .....Room 114

WEDNESDAY, FEBRUARY 20

FORENOON

9:30 Cardboard Manufacturers Assn.....Room 109
9:30 Technical Association (*Fine and Special Papers*).....Room 110
9:30 Technical Association (*Physical Standards for Pulp*)....Room 151
9:30 Technical Association (*Corrosion and Waste*).....Myrtle Room
9:30 Cost Association of the Paper Industry .....Room 115
10:00 Bristol Board Manufacturers.....Room 114
10:00 Writing Paper Manufacturers Association .....East Room
10:00 National Kraft Paper Manufacturers Assn. .....Tea Lounge
10:00 Woodlands Section, A. P. & P. A...Sun Parlor

AFTERNOON

12:30 Cost Association of the Paper Industry, *Luncheon* .....Room 115
12:30 Woodlands Section, A. P. & P. A., *Luncheon* .....Sun Parlor
1:00 Paper Makers Advertising Club, *Luncheon* .....Room 112
1:00 Binders Board Manufacturers Association, *Luncheon* .....Room 114
2:00 Technical Association (*Materials Testing*) .....Room 109
2:00 Technical Association (*Training for the Industry*).....Room 151
2:00 Technical Association (*Sulphite Pulp and Stuff Preparation*) .....Myrtle Room
2:30 Writing Paper Manufacturers Association, (*Fine Paper Division*) .....Room 110
2:30 Writing Paper Manufacturers Association, (*Sulphite Bond Division*) .....East Room
2:30 Southern Kraft Manufacturers Association .....Room 100

THURSDAY, FEBRUARY 21

FORENOON

9:30 Technical Association (*Soda and Sulphite Pulp*).....Room 151
9:30 Technical Association (*Mechanical Pulp*) .....East Room
9:30 Technical Association (*Paper Testing*) .....Myrtle Room
10:30 American Paper and Pulp Association, *Annual Meeting* .....Astor Gallery

AFTERNOON

1:00 Glazed and Fancy Paper Manufacturers Assn., *Luncheon* .....Room 112
1:00 Presidents' *Luncheon* .....Room 115
2:00 Technical Association (*General Session*) .....Myrtle Room
2:30 American Paper and Pulp Association, *Annual Meeting* (See Program Below) .....Astor Gallery

EVENING

7:00 American Paper and Pulp Association, *Reception* .....Astor Gallery
7:30 American Paper and Pulp Association, *52nd Annual Banquet* ....Grand Ball Room

Program of the Annual Meeting of the American Paper and Pulp Association

MORNING SESSION

10:30 Call to Order
10:35 Minutes of Fifty-first Annual Meeting
10:40 Secretary-Treasurer's Annual Report
10:50 Appointment of Nominating Committee
11:00 Standing Committee Reports

Tariff Committee—Milton E. Marcuse, chairman, Bedford Pulp & Paper Co., Richmond, Va.

Committee on Statistics—C. B. Morgan, chairman, S. D. Warren Co., 101 Milk St., Boston, Mass.

Committee on Simplification and Standardization—S. L. Willson, chairman, American Writing Paper Co., Holyoke, Mass.

Sub-Committee, National Committee on Wood Utilization—Reuben B. Robertson, chairman, Champion Fibre Co., Canton, N. C.

Advisory Committee to—

U. S. Dept. of Agriculture—George W. Sisson, Jr., chairman, Racquette River Paper Co., Potsdam, N. Y.

U. S. Dept. of Commerce—Norman W. Wilson, chairman, Hammermill Paper Co., Erie, Pennsylvania.

U. S. Bureau of Standards—Ernst Mahler, chairman, Kimberly-Clark Co., Neenah, Wis.

U. S. Forest Products Laboratory—R. H. Laftman, ch., Bogalusa Paper Co., Bogalusa, La.

Program of the Annual Meeting of the American Paper and Pulp Association

(Continued)

Joint Committee on Vocational Education—J. Norman Spawn, chairman, Champion Fibre Co., Canton, N. C.

National Committee on Waste Utilization and Stream Improvement—John D. Rue, chairman, Champion Fibre Co., Canton, N. C.

11:30 President's Address
12:00 Report of Committee on Development
1:00 Adjournment until 2:30

AFTERNOON SESSION

2:30 Report of Resolutions Committee
2:45 Future Possibilities in the Utilization of Cellulose
Dr. Chas. H. Herty, Chemical Foundation, Inc.
3:15 Trade Practice Conferences
Judge William E. Humphrey, Federal Trade Commission
4:00 Report of Nominating Committee
4:15 Unfinished and New Business
4:30 Adjournment

EVENING

7:00 Reception ..... Astor Gallery
7:30 Fifty-Sceond Annual Banquet. Grand Ball Room
Toastmaster—President D. C. Everest
Speakers—Sir John Edmiston, "Senator" Edward Ford, Rev. Dr. Nehemiah Boynton.

History Repeats Itself

Statement in Reference to Forthcoming Annual Meeting of the American Paper and Pulp Association

By D. C. EVEREST, President

Today the American paper industry finds itself in a position which is analogous to that existing after the Civil War. Then, after having shaken off the demoralization caused by the war, the industry enjoyed a brief period of prosperity. Prices increased; new mills sprang up; the industry flourished. But this prosperity was shortlived. It gave way to a period of intense competition and narrowed profits.

Now, since the World War, this history has been repeated. The slack has been taken up and the industry is again expanding; but our mills are being subjected to the most intense competition, a competition which involves the industry as a whole in its relation to other industries. This unusual combination of expansion and intense competition has brought grave responsibilities to the leaders of the industry.

How have the leaders of the Association used the responsibility of leadership entrusted to them? Will their policies meet the needs of this modern competition? Is the industry making it possible for the Association's leaders to protect it and promote its interests?

Member mills are the Association's stockholders; its officers, the Board of Directors. The Association belongs to the industry and the industry has every right to know how its association's affairs are being administered and what its officers' plans for the future are.

THIS YEAR'S MEETING IS IMPORTANT!

The annual meeting this year is of unusual importance as regards the Association's future work for the industry. Proposed new By-Laws and a new method of financing the Association will be considered and, most important of all, the Executive Committee hopes to present for discussion at this meeting the results of the Association's Committee on Development's recommendations covering **further co-ordination of the co-operative activities of the industry.**

I would therefore urge that every member mill be represented for discussion at the Association's 52nd annual meeting in the Astor Gallery of the Waldorf-Astoria Hotel on Thursday, February 21, 1929.

Hardy S. Ferguson of Hardy S. Ferguson and Company, consulting engineers, New York City, announces that he has admitted to partnership Moses Hay Teaze, member A. S. M. E. and E. I. C., and James Wallace Tower, member A. S. M. E. and A. S. C. E.

Reduced Railroad Fares

Major O. W. Porter, secretary of the American Paper and Pulp Association has issued the following statement:

We Made A Mistake! Our pink railroad rate card indicated that, under the new convenient **identification certificate** plan for reduced railroad rates, members of the Association coming to the industry's annual convention next month could use any train, from local to the Century or Broadway Ltd.

Unfortunately we have subsequently been advised by the railroads that under this **identification certificate** plan their crack trains, such as the Broadway Ltd., the Century and the Knickerbocker, can not be used for this reduced rate transportation under existing tariffs, either going to New York or for the return trip.

Sulphite Paper Manufacturers' Association

The National Sulphite Paper Manufacturers Association, under the presidency of J. M. Ward, of the Detroit Sulphite Pulp and Paper Company, have chosen Ralph T. Davis, of Indianapolis, as secretary. The office of the association is in the Conway Building, Chicago, Ill.

The executive committee, composed of J. M. Ward, R. L. Sisson, Jr., John E. Alexander, J. L. Stille and W. L. Edmonds has voted to have the American Paper and Pulp Association handle its statistics. Charts and statistical data will be distributed regularly to members covering bleached papers, fibres, manilas, M. G. sulphite, mill wrappers, greaseproof, imitation greaseproof, railroad manilas, paster, tag board and pattern and glassine, and also on subdivisions of these main groups.

Annual Meeting American Forestry Ass'n

The forests of the South will hold the national spotlight when prominent foresters and conservationists from all parts of the country gather at Jacksonville, Fla., February 27 and 28 for the annual meeting of the American Forestry Association.

Marking the first time that a national forestry convention of this scope has been held in the far South, bringing together a notable assemblage of specialists for the purpose of furthering southern forest conditions, the meeting is significant in that it follows closely the inauguration of the Southern Forestry Educational Project of the American Forestry Association in Florida, Georgia and Mississippi. This campaign, for which the Association raised $150,000 eclipses in scope anything ever before undertaken in the field of popular forestry.

Many notable speakers, among them Roger Babson, famous statistician, and Dr. Charles H. Herty, of the Chemical Foundation, New York, are on the program. The meeting will be held jointly with the Florida Forestry Association.

William Henry Sullivan

The sudden passing of William Henry Sullivan, vice president of the Bogalusa Paper Company, also vice president and general manager of the Great Southern Lumber Company, Bogalusa, La., was a distinct shock to his many friends and associates in the industry. Mr. Sullivan died January 26, 1929, at his home in Bogalusa, being sixty-fours years of age.

Mr. Sullivan was born at St. Catherine, Ontario, Canada. During his early years his inclination turned toward woodworking, which forty years ago brought him into association with the Goodyear family, founders of the Great Southern Lumber Company, which came into existence twenty-seven years ago.

Col. Sullivan was recognized as a captain of industry. His vision, deep convictions and determination achieved that which few individuals attempt. Though a prominent figure at large, he was in his community a much loved citizen, never too occupied with business to lend his assistance to civic movements. He was in the true sense a philanthropist, as it was said of him that his main object in life was to create something for the present and future generations. The reforestation movement has also suffered the loss of a great leader, for he had been instrumental in developing an extensive program for the growing of trees, and lived to see one of his cherished plans put into operation—the manufacture of redwood lumber at the Bogalusa plant. The first logs of this lumber came from California and were put through the Southern Lumber Company's mill on January 13.

The funeral services were attended by throngs from the entire countryside, as well as a large delegation of prominent men from other states. Surviving Mr. Sullivan are his mother, four children, a sister and two brothers. His wife passed away December 9, 1928.

Solution of the Water Supply Problem

The assurance of an adequate and satisfactory water supply at a reasonable cost is one of the most difficult problems confronting the management of many industrial plants. The lowering of the water table with attendant increased pumping costs, inadequacy of present wells, contamination of surface supplies, high cost of city water and similar factors, all have a way of changing the supply problem in a very few years. The development of its own supply by the average industrial organization often results in loss of the investment in wells and equipment, where the wells do not measure up to the anticipated capacity, or where the water is rendered unsuitable for use by contamination.

Enormous strides have been made in the design of efficient pumping equipment, but slow progress has been made in the development of water supplies on a basis of a guaranteed supply at a definite cost. An important step in this direction has, however, been made in the announcement of the organization of the Fairbanks, Morse Water Supply Co. The parent organization, Fairbanks, Morse & Company has, of course, been a builder of pumps for many years and has during that time supplied pumps for many of the large municipal and industrial plants of the country. The new subsidiary organization, however, approaches the water supply from an entirely new angle.

After a thorough geological survey and hydraulic investigation of a plant's water supply has shown favorable possibilities the Fairbanks, Morse Water Supply Co. agrees to deliver a definite quantity and quality of water at a definite price per thousand gallons. The industrial organization is not required to invest any money in the plant, which is installed and operated by the Fairbanks, Morse Water Supply Co., but purchases water at a fixed price for a period of years, at the end of which time it acquires complete title to the plant. In many cases the fixed price for water is so much less than the cost of city water or so much less than a plant's former pumping costs, that the new plant is paid for out of savings. Not only is an actual saving effected, but an adequate water supply assured.

The Fairbanks, Morse Water Supply Co., is headed by P. D. Bowler as vice president and general manager. Mr. Bowler is one of the founders of Layne & Bowler, Inc., and as president and general manager of that organization for many years is one of the outstanding water supply men of the country.

A Beater Stethoscope

Every trade develops its tricks, which persevere till some one thinks of a better way of doing things. For example, it is not unusual to see a beater man grab what looks like a short piece of broom handle from its resting place beside the roll, jab one end against the beater, the other to his teeth, and tell you, if you're interested, just how the roll is brushing. An extremely simple device, effective in its way, but subject to many objections, not the least of which is the unsanitary aspect of passing the begrimed, stock-encrusted stick from mouth to mouth as succeeding beater crews take up their tours of duty.

This old, crude, unsanitary "bite-the-stick" method of judging beater operation is now made obsolete by the new beater stethoscope offered by The Noble & Wood Machine Company of Hoosick Falls, N. Y. The beater stethoscope is simple, too, but far more effective, and certainly much cleaner than the stick method. The device is made of highly nickel-plated steel and consists of a series of rods connected by flexible ball and socket joints. At one end is a "listening ball." Th opposite end is attached to the bed plate box, the vibrations of which are communicated through the rods and ball to the ear of the operator, exactly as a physician's stethoscope records the heart beats and breathing of a patient.

The stethoscope is easily attached and is always in position for convenient use. The jointed arrangement makes it instantly adjustable for men of all heights. No special skill or training is required to operate it. In fact, the brushing action of the roll can be checked with far greater certainty than by the old stick method. Beater men who have had an opportunity to use the new stethoscope are quite enthusiastic about it.

New Magnetic Switches Simplify Installation

The General Electric Company announces the addition of two new switches to its general line of general-purpose starters for small alternating-current motors. The CR-7006-D-26-A is a three- and four-pole magnetic switch with self contained "START" and "STOP" stations, and the CR-7006-D-26-D is a switch for similar service but especially designed to provide plenty of wiring space.

The CR-7006-D-26-A is of standard design incorporating features for overload protection and undervoltage protection or release. It is used for starting and protecting small alternating-current motors that can be thrown directly on the line. It consists of a triple-pole, barrier-type contactor and a double-coil temperature overload relay, all mounted on a moulded base in a drawn-shell steel enclosing case. Added to these are starting and stopping contacts ordinarily provided by a remote-control push-button station. It is expected to be of particular value when used in installations where it is desired to locate magnetic switches at the driven machines, making remote push-button control unnecessary.

The CR-7006-D-26-D, although for the same general class of application, is designed for use with remote push-button stations. Its principal advantage is the especially large amount of wiring space provided. Mechanically, the switch mechanism is located below the center of the box to prevent interference with the mounting holes. This construction also allows plenty of room for the arc, preventing flashovers.

S. F. Bowser & Co., Inc., Fort Wayne, Ind., has created a new industrial sales district agency comprising greater New York, the entire State of Connecticut and twelve counties in New Jersey. E. M. May, formerly New York representative of the Richardson-Phoenix Co., Milwaukee, Wis., has been placed in charge of this agency and will have headquarters at the New York offices of the company, 67 West 44th St.

Opening of Canadian Cellulose Research Institute

Viscount Willingdon, Governor-General of Canada, Makes an Address and Starts the Machinery in Motion

THE Canadian Pulp and Paper Association met in annual session at Montreal during the week of January 21-25, headquarters being maintained at the Pulp and Paper Research Institute on the grounds of McGill University where the offices of the association are now located. The business transacted on Monday consisted of a meeting of the board of directors of the Canadian Paper and Pulp Research Corporation to consider the annual report to be presented to the association later in the week. On Tuesday forenoon the Pulp and Paper Research Institute was open to visitors who were conducted through the building by Dr. Harold Hibbert, professor of cellulose and industrial chemistry, McGill University, and Capt. E. Parke Cameron, director of the pulp and paper division of the Forest Products Laboratory. There was a constant stream of visitors to the institute during the day and admiration was expressed by all at the completeness of equipment seen everywhere throughout the building, from the laboratories for fundamental research on the upper floors, to the manufacturing control department in the basement, equipped with a complete papermaking machine as well as apparatus for pulp manufacture. At noon on the last day of meeting, the institute was formally opened by Viscount Willingdon, Governor-General of Canada. By pulling a lever he turned on the current and started the paper machine and other apparatus in motion, thus completing the inauguration ceremonies which had begun an hour previously with a reception and speech-making in the lecture room of the institute. His Excellency was accompanied by an aide-de-camp in full uniform. Members of the faculty and others in attendance entitled to do so wore their university hoods and gowns, those holding the doctorate degrees being resplendent in brilliant scarlets and yellows, making an impressive and colorful picture.

Meeting of the Research Institute

The first stated meeting on the program of the Technical Section was that of the Research Institute on Tuesday afternoon, January 22, under the chairmanship of Dr. C. F. Martin, dean of the medical school and acting principal of McGill University, who opened the program with an introductory address in which he referred to the inauguration of the building as a new epoch in the development of scientific research at McGill University. It was the first building connected with the university devoted to industrial research and confined in its early stages to that of pulp and paper research.

The Note of Co-operation—Dean Martin sounded a keynote which was struck by nearly all subsequent speakers, including Viscount Willingdon. He said the building and the Research Institute had been the result of co-operation by the Government, the Canadian Pulp and Paper Association and McGill University. Nothing could be done successfully without co-operation. In this case the Research Institute had received not only financial co-operation but the greatest and sincerest intellectual co-operation of all concerned.

Dean Martin gave credit to Doctor Hibbert for having told him that the main object of an institution of this kind was to ascertain the fundamental facts of science, and having done so apply them to industry.

Linking the University With Industry—On a recent visit to one of the great paper mills of Canada to discuss some of the problems of the relation of the university to industry he had made the suggestion that the university might help in supplying technical experts to the paper industry. He was told, as he said, in a very illuminating manner, that after all the fundamental purpose of the University was to train undergraduates, and often the graduates themselves, in fundamental facts; that when these had been obtained, then the industries themselves could promote, through their own means the development of men in the scientific application of these fundamental facts. With the inauguration of the Cellulose Research Institute a step farther had been taken and the University was now learning how to co-operate with the industry and make these fundamental facts of use to industry.

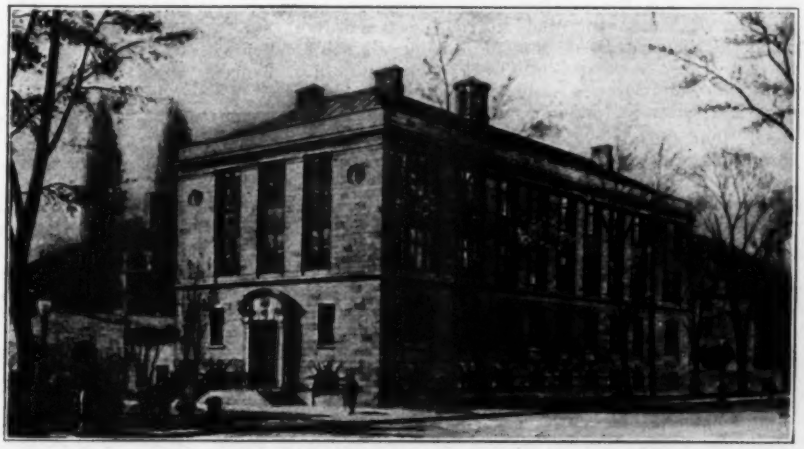
Dean Martin said that the University had come to a greater realization of the importance of chemical engineers with respect to the application of scientific facts to industry and there was every indication that in the near future a department of chemical engineering would be developed which it was hoped would meet with the success its importance deserved. He mentioned that all graduates who had passed out of the school studying along lines of industrial research had found good berths and were able to feel that their future was assured through the training they had received at the University. At the same time it made the University authorities feel that thus early in their career of industrial research work, they were making good.

Dean Martin then introduced Dr. W. D. Bancroft, professor of inorganic and colloid chemistry, Cornell University, Ithaca, N. Y., who was down on the program for a paper entitled "Bearing of Research on the Development of Industry".

Bearing of Research on Industry

Professor Bancroft of Cornell is known well and favorably throughout the chemical world as a man of great learning and a speaker of remarkable charm, can enliven his remarks with those humorous touches which deprive abstruse chemical topics of dullness, and liven up what is often a dry subject.

Doctor Bancroft began by saying that Dr. Charles H.



Pulp and Paper Research Institute, Montreal, Canada

Herty had put the capitalization of lumber, paper and the textile industry in the United States at $7,000,000,000 and had observed that little was being done by these industries in the way of fundamental research. Doctor Bancroft concluded that the industries were much better off in Canada, because in Canada those in authority were really active while on the other side of the line, while everybody was talking about it, nothing was done.

Necessity not the Mother of Invention—Doctor Bancroft quoted from a paragraph by Dr. W. R. Whitney, director of research of the General Electric Company, who had said on one occasion:

"Necessity is not the mother of invention; knowledge and experiment are its parents. This is seen clearly in the case of many industrial discoveries. High-speed cutting tools were not a necessity which preceded, but an application which followed the discovery of the properties of the tungsten-chromium-iron alloys; so, too, the use of titanium in arc lamps and of vanadium in steel were sequels to the industrial preparation of these metals, and not discoveries made by sheer force of necessity".

Industrial Use of Fundamental Research—Doctor Bancroft gave other instances to illustrate how the industries made use of fundamental research, and spoke of the manufacture of synthetic pulpstones by the Norton Company which are being used to advantage by the Canadian mills: first, however, telling how Hall discovered the method of making aluminum in this country almost simultaneously with a like discovery by Heroult in France. Heroult was told there was no possible market for aluminum and as a consequence he developed an aluminum alloy. Hall on the other hand insisted there was a market for aluminum, so he stuck to the pure aluminum and won out on it. It was the same with pulpstones. There was no demand for a better grindstone, the natural pulpstone being considered better than anything that could possibly be invented and when the Norton Company worked up to what they believed was a better grindstone it was difficult to get anybody to try it.

Research and its Results—The speaker recalled "the devil of a job" Dr. L. H. Baekeland had in getting the General Electric Company to show what Bakelite would do and now they were using it in large quantities. He said he could go on indefinitely with cases like that to show that W. R. Whitney was right. Doctor Bancroft said that in many cases there did not seem to be any connection between the research and the results of it. He instanced the rate of evaporation of water in the presence of the inert gas, air. Nothing could be less practical apparently, but he could give instances where that had come up. He mentioned the invention of Bakelite. Baekeland had said he would attempt that in the presence of air pressure and he did it. On the quantitative side, Langmuir, of the General Electric Company, made nitrogen-filled lamps and argon-filled lamps, which every illuminating engineer felt sure was an absurd thing to attempt, while now it is considered the best technical practice. Then there was the making of milk powder by the spray process. Milk is evaporated in air in such a way as not to reach the temperature of the surrounding air. A number of other research developments were mentioned. The hydrogenation of oils was the result of a desire to know how differently molecular hydrogen would act from natural hydrogen.

All Industries Face Over-night Development — Modern chromium plating and the discovery of accelerators for increasing the longevity of tires and cost of equipment were mentioned. Every industry was facing the possibility of over-night development. The case of madder being driven out by alizarine and of indigo being replaced by the synthetic compound went back a long ways but in modern times it has been seen how the woolen and cotton industries have been hit by rayon. Many industries would have liked to prohibit the production of rayon. Doctor Bancroft quoted from Howe's **Chemistry in Industry** to point the moral. In the first volume, published in 1924, the statement was made that all attempts to produce methyl alcohol from other substances than wood had been failures, though a new process might be forthcoming when the demand became sufficiently great. In the second volume of the book, published a year later, Doctor Howe made the statement that American industry had been disturbed by heavy imports of methanol, a synthetic wood alcohol. The Germans had found a catalyst, said to be zinc oxide, whereby water gas and steam are brought together in its presence to produce methanol, nearly 100 per cent pure. Water gas is generated by passing steam over hot coke in a retort. The comment of the author of **Chemistry in Industry** was, "Compare the cost of this with chopping down hard wood, chipping the wood, distilling it and then refining the product. Competition is impossible."

Making the Best of Adverse Circumstances—Many other instances were cited by the speaker, even to the invention of the paper milk bottle. He thought a process might be invented for hydrating cellulose fibers so as to avoid the use of the beater which uses so much power. And in regard to reeds, cereal straws and grasses which cannot be used for paper because they contain too much silica, he instanced the case of Trinidad asphalt which contained too much mineral and could not be sold until the Barber Asphalt Company advertised it as "the one asphalt on the market containing colloidally dispersed mineral matter". So instead of taking the silica out of reeds and similar raw papermaking material, which was an expensive process, the speaker suggested that steps be taken to gelatinize the silica and perhaps make a stronger paper which could be advertised and sold as such. He was not sure that it could be done or not, but it would be rather an amusing thing if it could.

The Rosin-Alum Problem—An interesting contribution to the theory of rosin sizing was made by Doctor Bancroft. He said he had once done some work on the chemistry of sizing. He was not sure whether the alum combined with the rosin or with the soda of the rosin size. Either all the free rosin which goes down the sink was wasted or was taken up by the aluminum, or the aluminum was deposited on the fiber. It might be that the fiber combined with the free rosin which would mean that the rosin was taken up in two ways. If so and possibly even in two different places, papermakers could not handle the problem of sizing until it was known definitely what actually happened.

Shattering Old Beliefs—Doctor Bancroft discussed the question of oxycellulose and alpha, beta, gamma and delta cellulose. He is of the opinion that these varieties of cellulose are mythical substances and poked some quiet fun at the references in the literature to them. He had no respect for the copper number which was so dear to the heart of cellulose chemists. The copper number would show how one sample of cellulose might differ from another and be valuable possibly to that extent. "But, as for showing anything else—well, it does not".

Problems in Cellulose Chemistry—He then went into some of the questions of higher cellulose chemistry and touched on mercerized cotton. He said it was a fearful job to determine how much caustic soda was taken up with the cellulose. There was nothing to show the existence of a combination, but Doctor Bancroft said he was prepared to discuss the subject in private with Doctor Heuser. Viscose may or may not be a compound. All that was obvious is that it is a perfect coagulation or a gel. Fundamental research was needed, he said, to explain why the wet strength of rayon is so low.

Functions of a Research Institute—Doctor Bancroft closed an interesting discourse with an expression of his views concerning the functions of a research institute, mentioning among other things that it should not be a service station to which people would get in the habit of sending in particular problems, "why did this go wrong today", etc. This kind of work should be kept separate. If the research institute ever gets going on problems of that kind it will cease to be a research institute for there will be no time for anything else. Plenty of funds and plenty of time were named as essential requisites for the functioning of a research institute.

Applying Science to Industrial Work

After thanking Doctor Bancroft for his contribution to the proceedings, Dean Martin resigned the chair to Doctor Johnson, who introduced Dr. W. K. Lewis, acting director of chemical engineering and technical research, M. I. T. School of Practice, who addressed the gathering on "Co-operative

Research between Universities and the Pulp and Paper Industry".

Doctor Lewis laid emphasis on co-operation, which he said was more nearly the open sesame to success in industry than any other single word. He described in considerable detail the methods pursued at the Massachusetts Institute of Technology for the maintenance of field stations in industrial plants throughout the country, comparing them with the plan pursued at the University of Cincinnati. Engineering was, he said, the art of applying science to industrial work, and an industry could teach its details better than the university. The whole success of the Massachusetts Institute plan was based on co-operation with industry.

Co-operation of Schools and Industry

"Engineering Research and its Relation to Industrial Problems" was the title of an address by Prof. H. M. Mackay, dean of the School of Applied Science, McGill University which was more of an academic discourse than those which preceded it. He took occasion, however, to call attention to some work that had been done at McGill University by Professor H. O. Keay on the causes leading to the explosion of a sulphite digester in one of the large Canadian paper mills some sixteen years ago. Professor Mackay also stressed co-operation and said it was a good omen for the success of the Research Institute that the industry showed a willingness to co-operate with the university and he assured those present of his earnest desire to co-operate in every way possible.

In bringing the proceedings to a close, Acting Chairman Johnson gave utterance to the sententious remark that "Education is what a man has learned after he has forgotten what he has learned".

Doctor Hibbert asked leave to extend the thanks of the Research Institute to the speakers of the day, and in the absence of Chairman Buncke, R. A. McInnis expressed the thanks of the council, consisting of himself, C. B. Thorne, John Stadler and A. P. Costigane to Doctor Hibbert for his conduct of the proceedings.

Canadian Pulp & Paper Ass'n Meets

Governor-General of Canada Opens Research Institute, is Guest of the Association at Luncheon and Addresses Members

THE program for the annual meeting of the Canadian Pulp and Paper Association on Friday, January 25, was arranged with special regard for the convenience of His Excellency Governor-General Willingdon, who was to appear promptly at noon to inaugurate the new Canadian Pulp and Paper Research Institute, in the Assembly Room of which the meeting took place.

Expediting the Business

Col. C. H. L. Jones, president of the association, opened the proceedings at 10 A. M. by calling for the reading of the minutes of the previous annual meeting.

Owing to the necessity of curtailing the proceedings to suit the convenience of the Governor-General, the report of the previous meeting was taken as read, particularly on account of it having been already published in pamphlet form and distributed to the members.

President's Address

President Jones summarized his review of the year's work. He began by calling attention to the sorrow felt by the members at the passing of I. H.Weldon and George H. Millen. Mr. Weldon took an active part in the work of the association and was president in 1915. Mr. Millen was widely known and highly esteemed as the directing force in the E. B. Eddy Company. He had reached the advanced age of ninety years at the time of his death. Mr. Jones said that Mr. Millen's life was an epic of faithfulness to his trust and a worthy example to those who might follow him.

Illness of Mr. Bothwell—Reference was made to the absence from the meeting of J. A. Bothwell, of the Brompton Pulp and Paper Company, Ltd., who was recovering from a serious operation in the Royal Victoria Hospital, Montreal. He expressed the hearty good wishes of all for Mr. Bothwell's speedy convalescence.

A Five-Year Program—As betokening the serious interest taken by the Canadian Pulp and Paper Association in the Scientific development of the industry, President Jones called attention to the projected program of activities during the next five years that will entail an expenditure of $70,000 a year in the furtherance of scientific research. A gratifying development of their own activity had been a quickening of interest in industrial research throughout the dominion. He instanced the new Central Bureau of Research at Ottawa for which the provincial government had established a fund of $2,000,000, since doubled by private contributions. President Jones said that the Canadian Pulp and Paper Association might take credit as being in the vanguard of the movement for the encouragement of industrial research, and the first of the larger industrial groups of the Dominion to co-operate for the advancement of the pulp and paper industry by organized investigation.

Sums Spent on Research Institute—He gave some figures of the cost of bringing the Pulp and Paper Research Institute to its present state of completion. The total cost of the building and its equipment will approximate $325,000, of which the association had provided or would provide about $279,000. Some $46,000 in addition will be provided by the government for a portion of the equipment. He made grateful reference to the action of those manufacturers of pulp and papermaking machinery and equipment, who had generously donated apparatus to an estimated value of $50,000.

Reference was made in the president's address to the merging of the Research Committee of the main association with the Technical Section, and the creation of a Joint Administrative Committee under the chairmanship of F. A. Sabbaton.

To Study Fuels—The establishment of a chair of Fuels and Fuel Technology at McGill University which was supported by the association, was mentioned. It was noted that the new department might be expected to render valuable service to coal-using industries and intimated that further financial assistance would be welcome. The association has assured the university of a stated sum yearly in support of the chair which had been already established and was now functioning.

Sectional Activities—Brief reference was made to the activities of the several sections of the association. It was noted that the Technical and Woodlands Sections were in a healthy state. The growth of the Technical Section and the development of its work assured of its affairs being placed on a more permanent basis, as its officers had long desired should be done.

The Situation in Newsprint—The situation in newsprint was touched upon. In his view, the worst of the situation was over and improvement not far distant. An encouraging feature was the steadily increasing demand for Canadian paper in both the American and the overseas markets.

Competition of foreign manufacturers of book paper has been increased by the removal of the duty on imports. Publishers of farm journals and of magazines for general circulation were now able to bring in their paper from abroad at a negligible rate of duty.

Lack of Tariff Protection—The address referred to the report of the Book and Writing and Fine Paper Section which called attention to the unfairness exhibited in depriving Canadian paper manufacturers of the benefit of the protective

policy upon which the economic structure of the country was based, while at the same time requiring them to pay duty on many articles and commodities which are necessary to their business.

American Competition—President Jones considered it an anomalous situation that Canada should provide a practically free market for American book-paper when the American market was closed to Canadian producers. He also deemed it anomalous that Canada should supply American paper manufacturers with a large proportion of their chief raw materials in the form of unmanufactured pulpwood without adequate return but with the effect of enabling them to compete with Canadian paper manufacturers in their own market.

The engagement of Louis Lemieux as an expert to check up on importations of paper into Canada that may be misclassified or undervalued was reported and Mr. Lemieux is now a member of the permanent staff of the association.

Future of the Association—In closing President Jones bade the members not lose sight of the problems and difficulties to be met in the immediate future. Financially, the association was committed to an ambitious program, one however which need not prove unduly burdensome if the members gave it their wholehearted and loyal support, as they had in the past. He said that while the association could congratulate itself on the advances in research work and improvements in manufacturing methods that followed, there still remained much to be done. The members should not let their enthusiasm for research obscure the fact that as a trade organization the association had other not less important functions which if left unperformed would decrease its value to many members. He said:"As an organization we exist, primarily, for the purpose of promoting the business of our members, of improving their service to the public through the compilation and distribution of information, and the cooperative handling of problems common to the production and distribution of the commodities with which we are concerned. The success of the association in the future, as in the past will depend very largely upon the manner in which we discharge these obligations."

On motion President Jones's address and the report of sections were adopted as printed.

Secretary Beck read the financial statement for the year as approved by the Executive Council. The budget for the ensuing year would call for an appropriation of 134,500.

K. S. Maclachlan to Research Corporation

Among routine business matters that were considered and acted upon was an announcement of the nomination of K. S. Maclachlan, of Alliance Paper Mills, Ltd., to serve as a member of the Research Corporation in succession to George M. McKee, in accordance with the rule for rotation of members on the Research Corporation.

Flowers for Mr. Bothwell

Percy B. Wilson suggested that it would be a nice thing to send a gift of flowers and a message of sympathy to past president J. A. Bothwell, at present recovering from an operation in the Royal Victoria Hospital. Appropriate action was taken by unanimous vote.

George Carruthers moved the passage of resolutions expressing the sorrow of the association at the demise of George H. Millen and I. H. Weldon.

President Jones announced that the names of a number of manufacturers who had donated equipment and machinery to the Research Institute would be printed in the proceedings of the meeting. L. R. Wilson expressed appreciation of the support extended by manufacturers and seconded a resolution for a special vote of thanks.

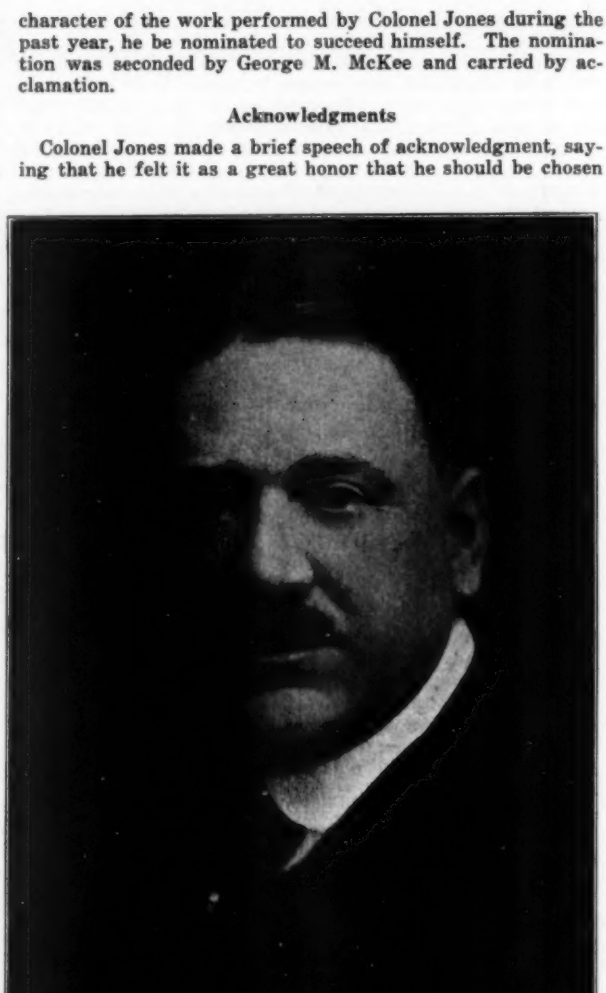
President Jones Re-elected

The election of officers then took place. It was announced by Secretary Beck, after President Jones had temporarily given up the chair to Percy B. Wilson, that nominations had been invited under the by-laws for the office of president and the only nomination received had been that of Col. J. H. Price, who had asked to be excused. The election was accordingly thrown into the meeting.

L. R. Wilson said that in view of the eminently satisfactory character of the work performed by Colonel Jones during the past year, he be nominated to succeed himself. The nomination was seconded by George M. McKee and carried by acclamation.

Acknowledgments

Colonel Jones made a brief speech of acknowledgment, saying that he felt it as a great honor that he should be chosen



Col. Charles Hugh Le Pailleur Jones
President of the Canadian Pulp and Paper Association.
Re-elected January 27, 1929

for reelection to the office. It would be his ambition to live up to the high standard of his predecessors whose average of efficiency he hoped he had approached during the past year.

Secretary Beck Thanked

F. G. Robinson, of the Canadian International Paper Company said he should like to see placed on the record some expression of appreciation of the work of Secretary Edward Beck and his associates, as well as that of Dr. Harold Hibbert and E. P. Cameron. At the suggestion of the chair the resolutions were separated and passed unanimously. Before adjournment a vote of thanks was tendered to Colonel Jones for his work as chairman of the Research Committee which goes out of existence this year, its work being taken over by the Technical Section.

Appearance of Viscount Willingdon

Promptly at twelve o'clock, the entry of Viscount Willingdon was announced. Preceded by an aide-de-camp in uniform he was escorted to the dais where he was greeted by President Jones who thereupon introduced him to the as-

sembly and thanked him for his presence at the inauguration of the institute.

The Governor-General of Canada is an accomplished public speaker and the address which he made before the members of the Canadian Pulp and Paper Association was delivered without notes. He said he felt proud because it was during his term of office that the Dominion Government was establishing an Institute of Research at Ottawa, and that it was hardly necessary for him to stress the necessity of research in a country which was working up and developing its industrial and commercial activities as Canada was doing. All Canadians were proud, on the medical side, of the fact that it was a Canadian, who, through research, made the discovery of insulin. Viscount Willingdon said he had adopted the word "co-operation" as a motto while Governor-General of Canada, and it seemed to him that the Pulp and Paper Research Institute showed the spirit of co-operation in a very special degree.

On the platform with the Governor-General were Hon. Charles Stewart, Minister of the Interior and Dr. C. F. Martin, acting principal of McGill University, both of whom also made addresses.

After an inspection of the laboratories on the upper floors of the building, the Governor-General and party descended to the basement to perform the ceremony of putting in motion the paper machine and other apparatus for pulp and paper manufacture there assembled, thus formally opening the building.

Speakers at the Luncheon

At the close of the ceremonies at the Institute, the party adjourned to the Ritz Carlton Hotel where the annual luncheon was held, the principal speaker being Dean Ira Allan Mackay, of the Faculty of Arts, McGill University. At the head table with Col. C. H. L. Jones, who acted as toastmaster, there were present the Governor-General, Viscount Willingdon, E. C. Mieville, Hon. Chas. Stewart, Percy Nobbs, V. W. Drury, Dr. H. M. Tory, Dr. C. F. Martin, Dean Ira A. Mackay, Lieut.-Col. Wilfrid Bovey, Hon. B. M. Baxter, Capt. R. W. T. Finnes, S. J. B. Rolland, George Carruthers, J. H. A. Acer, P. B. Wilson, Geo. M. McKee, L. R. Wilson, F. J. Campbell and General J. B. White.

In calling upon Viscount Willingdon, Colonel Jones remarked that it was the first time that a meeting of the Canadian Pulp and Paper Association had been graced by a vice-regal presence.

The Governor-General of Canada made an extremely pleasing appearance, interlarding a brief speech with a number of humorous observations. He said he was delighted to know that he was the first Governor-General to sit in with the pulp and paper and paper manufacturers. In his serious and solemn moments he had sometimes invested small sums of money in pulp and paper enterprises and would be glad to get some tips on the market.

In more serious vein, the Governor-General declared that the importance of the pulp and paper industry to the Dominion was fully realized by him. He referred to the period of overproduction in the summer months of 1928, but stated immediately after that it was as certain as anything that happens in Canada—"a land of prosperity"—that the industry would be an extremely prosperous one in future years.

A Great Speech by a Professor of Literature

Dr. Ira A. Mackay, Dean of the Faculty of Arts, McGill University, was then introduced, Colonel Jones reciting his academic degrees and titles, which made a lengthy list. Dean Mackay made a most impressive speech of great oratorical force and rhetorical ability, stressing the value of education in the creation of happiness and prosperity. To attain national greatness, there must be close cohesion between the government, industry and the universities. The two essential factors in nation building, he said, were a sound educational policy and sound industry. There was one clear light in the history of the people of the United States which shone brighter than all others and that was the munificent provision which they had always made for their institutions and foundations of education and research. If there was any advice which he could give to his Canadian fellow countrymen it would be: "Go thou and do likewise."

Why Scientific Research Should be Fostered—More scientific research must be fostered for two reasons, he said. First, to discover additional resources to develop, and second, to guide industry in the best possible development of the "gifts of providence."

The result of properly directed scientific investigation would be to increase wages and decrease the cost of production. Higher wages must be paid, said Dean Mackay, if the best workers are to kept in the country, while the cost of production must be reduced so that Canada will be enabled better to compete in the world markets.

A Plea for His Own Love—In closing he made a plea for what he termed in his romantic fashion "mine own love"—education in literature and the arts. Education in literature and arts has its essential economic value, he said. If there were no purchases there could be no producers. It was a vain thing to train our arguments on scientific men to produce commodities of great precision, power and beauty, unless we first create a community of sufficient discrimination and taste to purchase them when they are produced. One thought that he left with his hearers in closing his plea for higher education in literature was that prosperity never rises above the cultivation of literature.

Standing Vote of Thanks

Percy B. Wilson arose when the cheering which greeted the speaker had subsided and moved a standing vote of thanks to him. Mr. Wilson said that never in all his experience had he witnessed such a demonstration of approval as marked the reception of Dean Mackay's splendid oration.

The luncheon was concluded with the presentation to Rex W. Hovey, last chairman of the Research Section of the Association, of a large painting of the Pulp and Paper Research Institute. In Mr. Hovey's absence, E. P. Cameron was asked to accept the gift for him. Colonel Jones, who made the presentation, said that Mr. Hovey was general manager of the Oxford Paper Company and in his conduct of the Research Section had brought to the office an intimate knowledge of the sciences. It was largely through his ideas that the section had progressed so well and he wished to pay the utmost tribute to Mr. Hovey for his work.

Banquet of Canadian Association

Ministers of Four Provinces Attend and Make Appeal to Paper Industry to Stop Exports of Pulpwood by Buying from Settlers

THE sixteenth annual banquet of the Canadian Pulp and Paper Association, held at the Ritz Carlton Hotel, Montreal, on Friday evening January 25, was one of the most interesting and successful of the series. The menu, an enlaborate eight-page folder, bore as frontispiece a beautiful process picture of the Pulp and Paper Research Institute. The Prime Minister of Quebec, the Hon. L. A. Taschereau, headed the list of speakers on the menu, but he was prevented from attending by pressure of legislative duties in Quebec. His place was taken by the Hon. J. L. Perron, Minister of Roads for the Province of Quebec. The Hon. G. Howard Ferguson, Prime Minister of Ontario, whose name also appeared on the list of speakers was unavoidably absent and his place was taken by the Hon. W. F. Finlayson, Minister of Lands and Forests for Ontario. The Province of Nova Scotia was represented by its Prime Minister, the Hon. E. N. Rhodes, while Premier John B. M. Baxter represented the Province of New Brunswick.

Col. C. H. L. Jones was toastmaster and on either side of him at the head table, in addition to those already named were Hon. Charles Stewart, Minister of the Interior; Dean C. F. Martin, Acting Principal at McGill University; Hon. W. Frost, United States Consul General; Hon. L. Aubert, Consul General for Norway at Montreal; Hon. Magnus Clairholm, Swedish Consul General; Hon. W. N. Stevens; Dr. H. M. Tory, president of the National Research Council of Canada; F. J. Campbell, V. W. Drury, Percy B. Wilson, E. H. Buder, L. R.

Wilson, J. B. Rolland, George Carruthers, George M. McKee, J. H. A. Acer, and H. F. E. Kent.

Newsprint Situation Discussed

Several of the speakers discussed the newsprint situation and the export of pulpwood, but the provincial government representatives were unanimous in stating that the pulp and paper industry of the Dominion of Canada must solve its problems without government interference.

As Viewed in Quebec

The Hon. J. L. Perron, representing Premier Taschereau, was the first speaker. He declared that the solution of the present newsprint paper difficulty lay in the hands of the manufacturers themselves and suggested that the association develop a plan to prevent the export of pulpwood to the United States. He recalled that in 1909 and 1910 the total amount of timber cut in the Province of Quebec was about 1,000,000 cords and out of this amount 700,000 cords were exported to the United States, the remainder being converted to paper in the Province of Quebec. This situation did not appeal to the Prime Minister of that time, Sir Lomer Gouin, who then decided that no more pulpwood from crown lands would be exported to the United States. Since 1910, the cut of pulpwood had mounted to 3,000,000 cords a year, but the amount exported to the United States was still 700,000 cords. Instead of manufacturing from 300,000 to 350,000 cords there were now produced as finished product 2,000,000 cords per annum. After this account of developments, Mr. Perron made an appeal to the members of the association to get together and solve their problems. He said:

Advised to Support Settlers—"I have told you that in 1910 there were 700,000 cords of pulpwood exported to the United States and since that time this figure has not increased, fortunately, and with due respect to my friends of the United States. I believe, however, that the situation in this province is not what it should be. I do not believe that you should allow 700,000 cords of pulpwood to go to the United States, you who control the mills. Since 1910 these 700,000 cords have been exported from wood cut by settlers and small farmers. I need not tell you how jealous these settlers are for the development of this province (Quebec)."

Minister Perron reminded his hearers that these settlers were also necessary for woods operations in pulp and paper mill work and represented a capital investment which should not be destroyed. He thought that one solution of the problem would be the purchase of pulpwood from settlers at a reasonable price so that they could make a living out of their operations.

In introducing Hon. William Finlayson, Minister of Crown Lands for the Province of Ontario, Toastmaster Jones expressed the regret of the association at the indisposition which prevented Premier Ferguson from attending the banquet.

Ontario's Attitude

Mr. Finlayson, like the preceding speaker, said it must not be expected that an export duty would provide a remedy. The remedy lay in the hands of the industry and mills should buy the cut of farmers and settlers which is now going to the United States.

A Scotch Story and a Presentation

Toastmaster Jones at this point suggested a toast for Robert Burns, the anniversary of whose birth had been celebrated two days previously. This was followed by a Scotch story from George Carruthers.

Before introducing the Hon. E. N. Rhodes, premier of Nova Scotia, Mr. Jones called A. E. Cadman, assistant secretary of the association, to the head table and presented to him a gold watch and chain in recognition of his services to the association over a number of years. Mr. Cadman expressed his thanks.

Nova Scotia's Entry into the Newsprint Field

Premier Rhodes spoke of the recent entry of Nova Scotia into the newsprint field, referring to the building of the first pulp and paper mill in the province at tidewater. He touched on the advantages of the location as having all the year round harbor facilities, with harbors free of ice. The manufactured product could be transported by water at the lowest rate. Another advantage was the abundance of waterpower, not to speak of the proximity of the raw material to the mill.

Maritime Province Agrees with Quebec

Premier Baxter, of New Brunswick, followed Mr. Rhodes and expressed great optimism concerning the future of the pulp and paper industry in the Maritimes. New Brunswick did not perhaps possess as extensive waterpowers as Quebec and Ontario but development of these waterpowers by their owners had been encouraged and through this policy a load of debt had been avoided and the government brought into closer association with the pulp and paper industry.

The speaker said that the government of New Brunswick proposed to go hand in hand with the paper industry and there would be no government interference. "We do not want paternal, public control," he said.

News Print Bureau's Annual Meeting

Newsprint Paper Situation in North America Reviewed in Secretary's Report

THE annual meeting of the News Print Service Bureau took place at 3 o'clock on Thursday afternoon, following the Technical Section luncheon. The principal business, apart from the election of new officers to serve during the ensuing year, was the reception of a report by Royal S. Kellogg, secretary, dealing with production and shipments of newsprint paper in 1928, in connection with which graphic charts were exhibited showing the growth in newsprint production in the United States and Canada during the past fifteen years. An abstract of Mr. Kellogg's review of conditions in 1928 follows:

Operating at 83 per cent of rated capacity, which was the lowest ratio since 1921, the North American newsprint mills made 4,044,000 tons of paper in 1928. This was an increase of nearly 7 per cent over the previous year and equal to 60 per cent of the world production of this essential commodity.

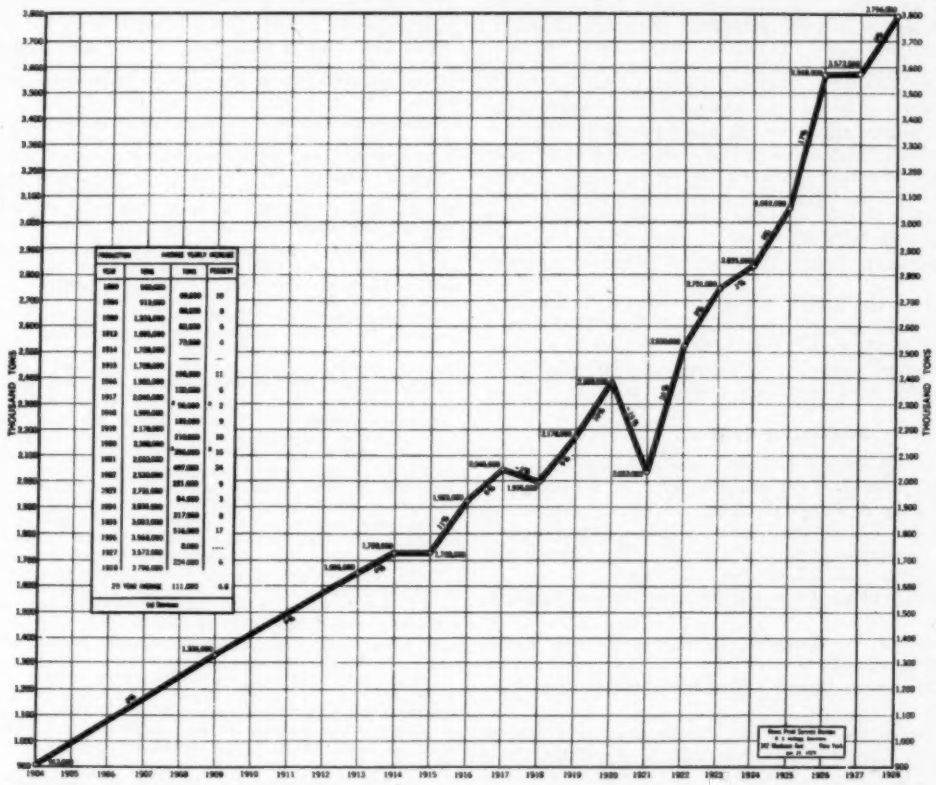
With an increase of nearly 300,000 tons over 1927, Canada turned out 2,380,000 tons of newsprint in 1928, or 59 per cent of the continental total, while Newfoundland's contribution of 230,000 tons was 28,000 tons ahead of the previous year, and the 17,000 tons made and used in Mexico was a 20 percent increase for that country. Contrasted with new high records in Canada, Newfoundland and Mexico, the 1,415,000 tons of newsprint made in the United States in 1928 was a decrease of 70,000 tons from the previous year and the smallest production since 1921.

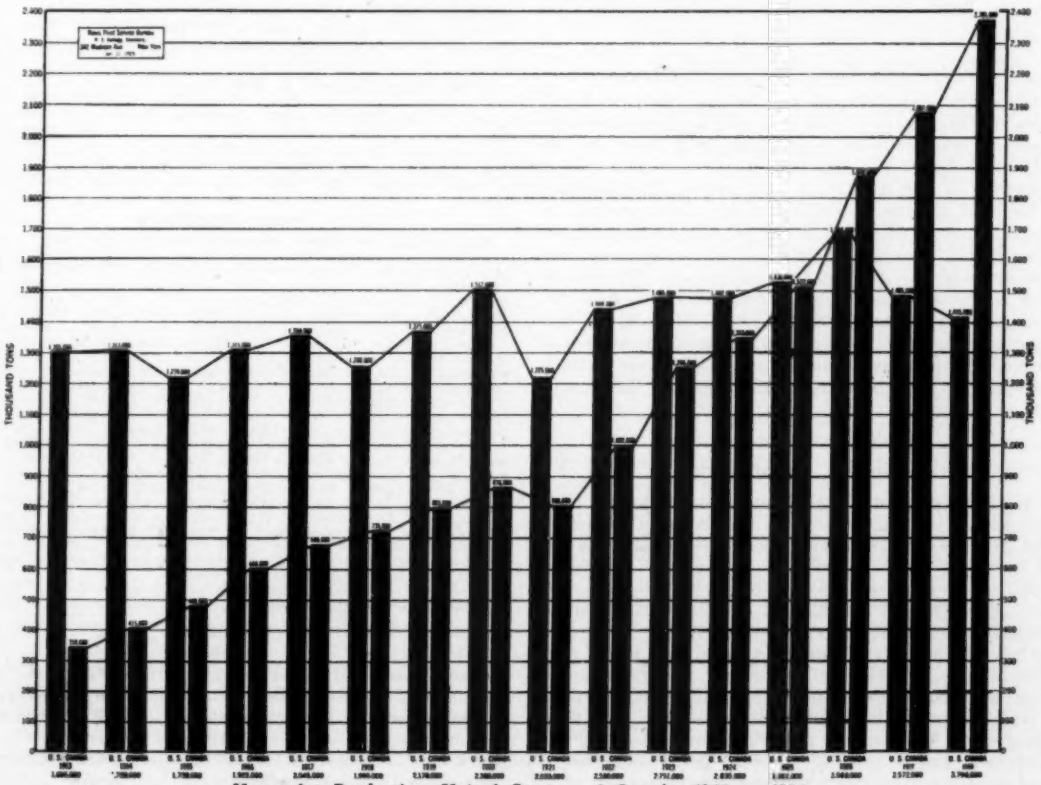
Shipments of paper from the mills during 1928 finally equalled production. There was a midyear period of excessively heavy stocks, but these were worked off during the Fall, so that at the end of the year tonnage at the mills was equivalent to the normal figure of three-and-a-half days' production. Canadian exports of newsprint were 92 per cent of production and 82 per cent of these exports went to the United States. On the other hand, Canada sent approximately 275,000 tons of newsprint overseas in 1928, compared with 133,000 tons in 1927. There was also an overseas export of 98,000 tons of newsprint from Newfoundland in 1928 and of 11,000 tons from the United States. Offsetting the 116,000 tons of overseas newsprint which came into the United States last year leaves a net continental balance of about 270,000 tons, or 7 percent, which was marketed abroad —and this 7 percent, it will be noted, is the same figure as the increase in continental production in 1928.

Canada's overseas shipments of newsprint in 1928 went about 45 per cent to Great Britain, about 25 per cent to Australia and New Zealand and nearly as much to the West Indies, Central and South America. Newsprint imports into the United States from abroad came in the proportion of 48 percent from Sweden, 35 per cent from Finland, 9 per cent from Norway and 8 per cent from Germany. The average importation of overseas newsprint into the United States for the years 1921-1928 inclusive was 137,000 tons.

Newspaper advertising in thirty leading cities in 1928 was

Newsprint Production, United States and Canada





Newsprint Production, United States and Canada, 1913 to 1928

2 per cent less in volume than in 1927 and 6 per cent below 1926. The newspapers of 100,000 circulation and over in the United States averaged thirty pages for the daily issues in 1928 as in 1927 and 1926. The Sunday issues, however, were reduced to 104 pages in 1928 compared with 107 pages in 1927, 111 pages in 1926 and 109 pages in 1925. Total English-language daily newspaper circulations were reported at 37,973,000 copies for the six months ending September 30, 1928, and at 25,772,000 copies for the Sunday issues, which represented only a slight gain over the same period in 1927.

Total newsprint consumption in the United States in 1928 was in the neighborhood of 3,500,000 tons or 58 lb. per capita, the same as in 1927 and 1926. A consumption of 50 lb. per capita was reached in 1923, and the jump from this figure to 58 lb. per capita in 1926 led some to think that a similar rate of increase would follow 1926. Such, however, has not been the case.

The capacity of the North American newsprint industry has doubled in the past ten years and is now 16,000 tons daily, of which 10,000 tons is in Canada. There is also an additional Canadian capacity in excess of 500 tons daily scheduled to come into operation during the first half of 1929.

Officers for 1929-30

In the election for officers to serve during the ensuing year the only change made was the selection of J. A. Bothwell, of the Brompton Pulp & Paper Company, as vice president to succeed F. J. Campbell, of the Canada Paper Company, since that company no longer makes newsprint. The officers and executive committee consist of the following:

President—Louis Bloch, Crown-Willamette Paper Company, San Francisco.

Vice-President—J. A. Bothwell, Brompton Pulp & Paper Company East Angus, P. Q.

Secretary-Treasurer—Royal S. Kellogg, 342 Madison Avenue, New York.

Executive Committee—Percy B. Wilson, Abitibi Power & Paper Company, Montreal, chairman; J. L. Apedaile, Price Brothers & Co., Quebec; A. R. Graustein, International Paper Company, New York.

Celotex Co. Has New Product

The Celotex Company, Chicago, will build an additional unit at its plant in Marrero, La. This unit will house the seventh board machine, and increase production of Celotex to one and a half million feet per day.

This company is also erecting a new unit at the Louisiana plant to be used for the manufacture of a new product, to be known as hard panel board which is manufactured from sugar cane fiber. This new board is of a homogeneous material, analogous in this respect to a steel plate. It contains no glue or binder and its unique strength results from the highly compacted and dense mass of interlocking fibers that are pressed together under enormous hydraulic pressure and heat. During the process of manufacture, the fiber is made water resistant so that the material absorbs very little moisture when it gets wet.

Franklin H. Kalbfleisch

Frank H. Kalbfleisch died at his home in Babylon, Long Island, on January 30th, 1929. He was born in Brooklyn, N. Y., on March 3rd, 1846, and spent his lifetime in the chemical business. Mr. Kalbfleisch was a son of Martin Kalbfleisch, who came to this country from Holland (his birthplace) in 1829 and established the chemical business which Franklin H. Kalbfleisch entered in 1870.

During his lifetime Mr. Kalbfleisch organized many companies in various branches of chemical manufacture and later these were consolidated into The Kalbfleisch Corporation, of which he was the head until 1920 when, due to ill health, he retired from active participation in the business. Mr. Kalbfleisch was a man of resolute personality but of kindly and generous disposition and enjoyed the respect of all who knew him. He leaves two daughters.

New Catalogues, Books and Publications

Bristol Co., Waterbury, Conn.—Bristol's Pulp Beater Motion Recorder provides continuous chart records of beater roll movement during entire beating period, and is described in a new folder just out, which contains an illustration of paper mill installation.

Erie City Iron Works, Erie, Pa.—A new bulletin "Powdered Coal for the Horizontal Tubular Boiler", contains a write-up with illustrations covering this company's powdered coal burning equipment.

Farrel-Birmingham Co., Inc., Ansonia, Conn.—A booklet announces a new series of Farrel-Sykes speed reducers which have been designed for roller bearings and Sykes gears.

General Electric Co., Schenectady, N. Y.—Folder 874C describes and illustrates Type WD-200A Arc Welder, current range 60 to 300 amperes. Type WD-400A Arc Welder, current range 100 to 500 amperes, is covered in folder 876B.

Hammermill Paper Co., Erie, Pa.—"Quicker Collections with Less Grief" is the subject of Report VI of the Hammermill Survey of Business Practice, a report to business executives based upon survey and studies by the research staff of the Business Training Corp. This report deals with the relation of collections to every line of the business, the responsibility of credit manager and his department, co-ordination of sales and credit departments, principles which should govern a well-managed credit department, etc. The report is subheaded and supplemented with suggested forms for keeping collection records.

Niagara Alkali Co., Niagara Falls, N. Y.—This company has just published an attractive leather bound book for users of caustic soda and caustic potash. The book is a complete reference guide for every industrial process employing these chemicals. The subjects are handled in detail; the chapters cover the properties and packaging of solid caustic soda, the handling of liquid soda, construction and equipment of storage tanks, analysis of caustic soda and typical layout for liquid caustic soda transfer and storage. Caustic potash is equally well handled, with method of analysis, package specifications, meaning of values and tests and description of uses. The value of the book is amplified by tables which simplify the use and ordering of caustic soda and caustic potash. Copies upon request.

P. H. & F. M. Roots Co., Connersville, Ind.—A new 16 page bulletin No. 33-B1 on high pressure type rotary gas pumps gives complete tabulated data on pressures, capacities and horsepowers, a brief review of various types of pumping units, and a comprehensive two-page construction drawing showing the typical unit in detail. The bulletin is so constructed to make it a valuable addition to the large Roots catalogue covering pumps, motors and blowers.

Swenson Evaporator Co., Harvey, Ill.—Article IV of the series on Heat Transfer and Crystalization by Prof. W. L. Badger has been received. In this chapter Professor Badger treats the subject of Heat Transfer Coefficients in Evaporators, using tables and diagrammatic illustrations.

Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa.—A few of this company's outstanding engineering achievements during the year 1928 are described and illustrated in an interesting booklet. Among these is mentioned the new mill of the National Paper Products Co., Port Townsend, Wash., which is said to be the first paper mill to have individual motor drive for baby presses and cylinder moulds. This mill also uses carbon pile voltage regulators.

BOOK REVIEWS

Bibliography in Paper Making 1900-1928—The only work of its kind, a bibliography of papermaking, covering the literature of the world so far as available from 1900 to 1928 inclusive, has been compiled by Clarence J. West, Ph. D., bibliographer, National Research Council, Washington, D. C., and published for the Technical Association of the Pulp and Paper Industry by the Lockwood Trade Journal Company, Inc., New York City.

When the magnitude of the paper industry is considered, it is indeed surprising that there has never been a previous attempt to assemble the literature relating to papermaking covering any extended period of time. The Committee on Bibliography of Tappi was organized about 1917 with H. E. Surface as chairman. The idea has grown from the compilation of the activities of various research groups into the splendid volume just published.

The question of classification presented a most difficult problem in the compilation of this work, one which the reader does not readily comprehend on glancing through the book, so logically have all subjects been assembled. References relating to one subject are listed in their respective sections alphabetically by the name of the author, followed by the subject of the article and reference to the publication in which it appeared. By using the table of contents which is listed by sections, and referring to the index wherein subjects are cross referenced, the reader may quickly locate any particular reference desired.

Such contributions to research are invaluable, and the highest commendation is due those who so diligently labor to further the progress of the industry.

The book is priced at ten dollars.

The Cameron Machine Company of Brooklyn, N. Y., report that one of their machines is now nearing its twentieth year of service and is still going strong. The Camachine, still in use by its original owner, Anthony Eisler and Co. of New York City, is employed in slitting and winding gummed tape. According to the manufacturers, the machine holds promise of some years of efficient and economical service.

Technical Papers and Discussions

Sixteenth Annual Meeting of Canadian Pulp and Paper Association's Technical Section Reviewed in Detail

THE opening sitting of the sixteenth annual meeting of the Technical Section, Canadian Paper and Pulp Association, took place in the lecture room of the Pulp and Paper Research Institute, Montreal, on Wednesday morning, January 23, with H. J. Buncke, chairman, presiding, and Edward Beck acting as secretary. After calling the meeting to order Chairman Buncke introduced Col. C. H. L. Jones, president of the association, who expressed the pleasure it afforded him to greet the Technical Section at the first of its meetings to be held in the Cellulose Research Institute.

Pride in New Home

Colonel Jones gave an interesting extemporaneous address in which he traced the development of the Canadian Pulp and Paper Association and the growth of interest in research work. For a long time the association had no home of its own, but today it was meeting under its own rooftree, in the midst of things which appealed both to executives, scientists and technologists from the point of view of laboratory and research equipment.

Origin of the Research Institute—Six years ago research in certain respects had been taken from the Technical Section, and it was felt at that time that the work of the section had been more or less devitalized by removing from it something that was particularly technical. It was decided that a special committee be formed and a special section was subsequently designated to carry on and develop research. Out of that section came the Research Institute, which, he said, was not the child of any one technologist in the association, but was the result of co-operative effort which grew with the association. Colonel Jones said it was the particular function of the Technical Section to see that research was developed to its fullest extent.

Grew From Small Beginnings—Reviewing the history of the Canadian Pulp and Paper Association from early days, he showed how small were the beginnings and then contrasted these with the action of the executive council at a meeting the day before when they voted $140,000 as the budget for the current year. He could recall the first budget discussion when it was only after a great struggle that the appropriation was raised to $7,000.

He laid stress on the fact that the bulk of the money appropriated this year was for research.

President Jones concluded by congratulating the Technical Section upon the progress it had made.

Response by Chairman Buncke

Chairman Buncke thanked the speaker and improved the opportunity to say that Colonel Jones had always been a member of the Technical Section and one of the leaders in building up the organization. Without his help and that of other members of the Executive Council, the section could not have advanced as it had. The Research Institute would not have been possible and the Technical Section would have been under a heavy handicap in carrying on its work.

Annual Report of the Chairman

Secretary Beck was then asked to present the chairman's annual report, which he did in abstract form, giving the high lights of the work transacted during the past year. It was noted that there had been a substantial increase in membership and the bank account of the section showed a balance of $910.51. At the last annual meeting of the association, action was taken to provide a scheme of organization and operation for the Research Institute after the Technical Section had become familiar with the various plans in progress. Joint meetings of the Research Section and the Technical Section had been held and as the result of these meetings a resolution was unanimously adopted by both sections on May 31, 1928, in which it was recommended to the Canadian Pulp and Paper Association that administration and control of the co-operative research work of the Pulp and Paper Research Institute be invested in a committee composed of three members appointed by the Executive Council of the association, two by the Government and two by McGill University. The Executive Council of the association named F. A. Sabbaton, Canada Power & Paper Company, Ltd.; Dr. J. S. Bates, Price Brothers & Co., Ltd.; H. J. Buncke, Abitibi Power & Paper Company, Ltd. The Dominion government had in the meantime appointed as members of the Joint Administrative Committee, E. H. Finlayson and T. A. McElhanney. Mr. Sabbaton was made chairman and Edward Beck, secretary.

Changes in Organization of Section—After a study of ways and means of serving the industry more effectively, a few changes in details of the organization of the Technical Section were adopted and submitted for the approval of the Executive Council, chief of which called for the appointment of a technical engineer-secretary, and the association was requested to vote an appropriation of $10,000 to the Technical Section for salary and operating expenses of this activity. The conclusions of the committee on reorganization was stated as follows:

1—There are a large number of problems which are of general interest and which furnish an excellent opportunity for co-operative work through increased committee activity. A questionnaire has been sent to the Section members, so that the members may be grouped according to their specialty. It is recommended that the following committees be considered and appointments for 1929 made depending upon the interest shown at our January meeting: Wood, Cellulose, Power & Heat, Groundwood, Sulphite, Newsprint, Sulphate and Soda, Fine Papers, Mill Engineering.

2—The function of the Technical Section in respect to a Research Institute and Industry are:

(a) To suggest research problems for consideration by the Technical Council and Administrative Committee of the Institute, which are of general importance and likely commercial value.

(b) To arrange co-operation between individuals, committees, and mills with the Research Institute.

(c) To convert the results produced by the Research Institute into operating profits for the member companies.

The Technical Section have therefore a definite part to play in our co-operative effort and the hoped for results can only be obtained by united effort.

3—Closer contact with the official organ of the Section, the Canadian Pulp and Paper Magazine and a special section set aside in it for direction by the Technical Section is recommended.

4—The activities outlined above call for assistance to the committees, technical correspondence and meetings in carrying out the co-operative work which requires more time than can be given it by any member of the Council. Your Council, therefore, recommend that a technical engineer be engaged who will work under the direction of the Technical Council and that the Association be requested to vote an appropriation of $10,000 to the Technical Section for salary and operating expenses for this activity.

5—The expansion of our industry in Canada has brought with it a necessity for changes in our bylaws to accomplish the following results in respect to our Council Organization:

Power Saving . . . Profit Saving . . . Longer Life . . . Faster, Steadier Production with equipment operating on . . .

HYATT
ROLLER BEARINGS
PRODUCT OF GENERAL MOTORS

Wherever installed on wheels, drives, shafts, gears, and motors, smooth rolling Hyatts transmit power without effort or waste. Practically frictionless, they avoid the sticking and drag of plain bearing surfaces.

The Hyatt Roller Bearing with outer race cut away to show construction of roller assembly. Our engineers will gladly submit bearing designs for any application in which you are interested.

Equipment lasts longer when rugged Hyatts are employed. Immunity from bearing breakdowns insures faster, smoother production. Attention is confined to infrequent lubrications. Labor and maintenance costs are negligible.

Throughout all industrial applications, as in railroad, automotive, mining and agricultural equipment, engineers have found that the Hyattway is the Saving Way.

HYATT ROLLER BEARING COMPANY

Newark Detroit Chicago Pittsburgh Oakland

(a) An increased term of office for Council men sufficient to allow them to become familiar with the details of organization, plans, and objectives of the Section.
(b) A rotating term of office for Councilmen.
(c) A greater representation on the Council.
(d) Provision for a technical engineer.

With the above objects in view, it is recommended that "Article IV, Officers and Council," be amended by striking out the present first two paragraphs, and substituting the following:

"The Officers of the Section shall consist of a Chairman, an Executive Council of six members, and a Secretary-Treasurer.

"The Chairman shall be elected by the members of the Section at the Annual Meeting, and shall hold office for one year, or until his successor shall have been elected and qualified.

"The Executive Council shall be elected by the Members of the Section at the Annual Meeting, for a period of three years, except that at the first annual meeting following the adoption of this by-law two members shall be elected for three years, two for two years, two for one year, and that thereafter two new members shall be elected each year to replace the retiring members.

"The Council as a whole shall pass upon applications for membership, transact the business of the Section between meetings, and shall have the general administration and control of the affairs of the Section.

"The Chairman of the Section shall be an ex-Officio member of the Executive Council, and shall preside at its meetings.

"The Secretary-Treasurer shall be appointed by the Executive Council and shall hold office at its pleasure."

To make Article III Membership accord with increased personnel of Executive Council the following changes are recommended: Strike out of paragraph 8 the words "In each case four affirmative votes out of five Members of the Council are necessary to election," and substitute the following:

"In each case, five affirmative votes by members of the Council are necessary to election."

6—The Woodlands and Technical Sections have progressed to a point where problems in respect to wood have developed. At the suggestion of the Woodlands Section, one session during the January meeting has been set aside for a joint meeting at which papers by Technical and Woodland Members will be given on these problems. This meeting will be closed to members of the Sections only.

The subject of Wood is a very broad one and it is recommended for 1929 that the Technical Section appoint a committee on wood, taking as their immediate problem the preparation of a "Manual of Wood Measurement."

Comment on Recommendations—Mr. Buncke's report as chairman was brought to a close with expressions of thanks to the Section and the Executive Council for assistance and support and to Secretary Beck, Assistant Secretary Cadman and their staff for co-operation and services throughout the year. In elucidation of the recommendations of the Committee on Organization, Mr. Buncke said it would be necessary to separate the Technical Section into two divisions, one for purely industrial work and the other for research investigations. The technical engineer-secretary would serve as a liaison officer or connecting link between the Technical Section and the Research Section. He announced that the consent of the association had already been given to the appropriation of $10,000 for salary and operating expenses. When the Research Committee took up the proposed groundwood research, an industrial angle would be given to it by experts on the mill end.

State of the Treasury

Secretary Beck was then asked to submit his financial statement. He showed receipts for the year ending December 31, 1928, of $2,970.58, the bulk of the amount representing dues of members. The disbursements amounted to $2,060.07, spread over expenses of meetings, stenographic expenses and subscriptions to magazines. The balance in bank amounted to $910.51.

The membership of the association numbers 223, comprising 146 active, 11 associate, 58 junior, and 8 student members. Several applications were pending to be acted upon at this meeting.

REPORTS OF STANDING COMMITTEES

Reports of various standing committees were then received, the first being that of the Administrative Committee, F. A. Sabbaton, chairman, an abstract of which follows:

Administrative Committee

The Joint Administrative Committee to assist in carrying on the work of the Research Institute came into existence shortly after the merging of the Research Section with the Technical Section. The committee at present comprises four representatives of the Canadian Pulp and Paper Association and two representatives of the Dominion Government. The committee is to be enlarged by the addition of two representatives of McGill University. By arrangement with the association the Technical Section was permitted to name the association's representative on the committee, the personnel at present comprising F. A. Sabbaton, chairman; H. J. Buncke, J. S. Bates and Edward Beck. The committee controls the expenditure of whatever funds may be voted by the association. At present the association is contributing $20,000 a year to the enterprise. A further grant is being asked for. The program of work carried on by the Pulp and Paper Division is also subject to the Committee's supervision. A general reference to its activities will be found in the report of Chairman Buncke.

Additions to Staff of Institute—Within a few weeks the Institute will be completed and in full operation. This will require additions to the staff which are now receiving the careful consideration of the committee. It is the hope and expectation of the committee that close co-operation will be maintained between the members of the Technical Section and the committee through the medium of special committees to be appointed by the section to work in conjunction with the Administrative Committee and the active staff of the Institute. As a preliminary means to that end, a questionnaire has been sent to the members inviting them to indicate the subjects in which they are particularly interested, to specify any special studies which they would like undertaken, as well as to declare their willingness to serve on special committees, and if so, to indicate their choice of such committees.

A supplementary report was submitted on Progress of Work, together with a "Report Covering Investigation of Formaldehyde-Sulphuric Acid Dissolution of Wood", by Dr. J. H. Ross, of the Divisional Staff. It was recommended that the papers be included in the printed proceedings of the annual meeting.

The following are extracts from the general reports submitted by the director of the Pulp and Paper Division, Forest Products Laboratories of Canada, to the Administrative Committee of the Research Institute as follows:

Formation Studies—Work in this field has been largely confined to a further study of the freeness test, its methods of measurement and the variables affecting it. Definite progress has been made in the isolation of these variables and the elimination of their effect on the test. This is particularly true of dissolved air in the water. Based on these findings a modified type of tester has been designed to be built in glass and it is hoped that this will be in working order for demonstration at the annual meeting.

Flexibility of fibers as an index to their hydration has been thought a possibility and accordingly attempts have been made to measure this characteristic. The first method under consideration at the present time looks hopeful.

Measurements of the vapor pressures of water over pulps of different degrees of hydrations is being studied to determine the most suitable form of apparatus for this work.

Sulphur Dioxide Solutions—In a study by W. B. Campbell there has been evolved a theory of the action of SO_2 on water which is along unusual lines. The final report on the investigation will be delayed until Dr. Maas has reviewed the work.

Methods of Analysis—A compilation of the various tests and analysis used in pulp and paper work has been assembled.

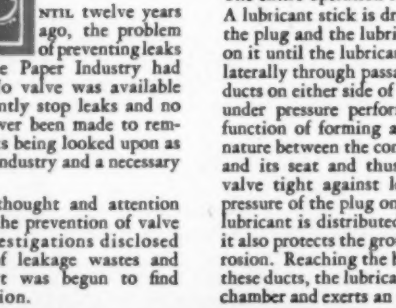
A typical installation of the lubricated Nordstrom Valve

The USE of Lubricant to Prevent Valve Leaks!

UNTIL twelve years ago, the problem of preventing leaks in valves used in the Paper Industry had never been solved. No valve was available which would permanently stop leaks and no particular effort had ever been made to remedy the difficulty...leaks being looked upon as a necessary evil of the industry and a necessary waste of operation.

Gradually, however, thought and attention were concentrated on the prevention of valve leaks. Thorough investigations disclosed the enormous costs of leakage wastes and a conscientious effort was begun to find a satisfactory solution.

Among the men who devoted their time and attention to the creation of a valve which would permanently stop leaks was S. J. Nordstrom, an engineer of marked ability and reputation in his profession. Nordstrom, however, sought not only a leakless valve, but a valve that could also be lubricated and its plug loosened in case it should ever become stuck, thus providing a remedy for the major valve troubles in one type of valve.



Nordstrom Valves are in service on all types of lines.

The result was the Nordstrom Valve...a valve that has proved very satisfactory in its operation.

A Patented Hydraulic Principle

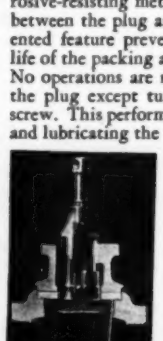
The Nordstrom Valve utilizes the principle of hydraulic pressure, obtainable up to 2,000 pounds to the square inch, by the quick and easy turning of a lubricant screw at the top of the valve. This screw can be turned by the finger tips and requires no special tools or skill. The entire operation is simple:

A lubricant stick is dropped into the shank of the plug and the lubricant screw turned down on it until the lubricant in the shank is forced laterally through passages leading to lubricant ducts on either side of the plug. The lubricant under pressure performs the very important function of forming a seal of highly viscous nature between the contact surfaces of the plug and its seat and thus efficiently renders the valve tight against leakage, without undue pressure of the plug on its seat. Once a film of lubricant is distributed throughout the valve, it also protects the ground surfaces against corrosion. Reaching the base of the plug through these ducts, the lubricant fills a sealed lubricant chamber and exerts an upward pressure on the base of the tapered plug. This releases the plug instantly, if tight. Thereafter, a slight turn of the lubricant screw and plug will repeat the operation at any time.

Outstanding Features of the Nordstrom Valve

The standard Nordstrom Valve is quarter-turn, and a stop is cast on the cover to indicate clearly to the operator the direction in which to turn the plug for opening and closing. The lubricant ducts are so arranged that the contents of the line do not come in contact with the ducts. The result is that the lubricant is always in the ducts and is not dissipated by the material in the line.

A check valve, inserted in the shank of the plug as an additional precaution, permits the removal of the lubricant screw, thus enabling the operator to insert lubricant while the valve is under pressure and temperature. This valve also insures the operator against danger when the contents of the line are of an injurious nature. The plug is held in its seat at all times by an elastic packing so arranged that it cannot be affected by the contents of the line, due to a corrosive-resisting metallic diaphragm interposed between the plug and the packing. This patented feature prevents leaking, prolongs the life of the packing and permits of free turning. No operations are necessary to seat or unseat the plug except turning down the lubricant screw. This performs the function of unseating and lubricating the valve. A turn of the valve insures against leakage.



Lubricant sticks are made to fit the various sizes of reservoirs and the Merco Nordstrom Valve Company supplies the kind of lubricant best adapted to the conditions under which the valve operates. "Merco" lubricants are adapted to all kinds of services.

Nordstrom Valves are manufactured in several different types, depending upon the size of the valves and the services for which they are intended.

At your request, the Merco Nordstrom Valve Company will send you its latest Catalog No. 6, which illustrates and describes in detail the advantages of the Nordstrom Valve. Write to any one of the offices at the following points: New York, 11 W. 42nd St.; Boston, 184 Boylston St.; Buffalo, Genesee Bldg.; Detroit, 2842 W. Grand Blvd.; Pittsburgh, Clark Bldg.; Chicago, 176 W. Adams St.; New Orleans, Masonic Temple Bldg.; Houston, Petroleum Bldg.; Dallas, Magnolia Bldg.; Los Angeles, 556 S. San Pedro St.; San Francisco, 343 Sansome St.; Seattle, Colman Bldg.

Merco Nordstrom Valve Co.
Subsidiary of The Merrill Company
Engineers :: Manufacturers
Factories; Oakland, Calif., and Belleville, N. J.
Canadian Mfrs.-Peacock Bros., Ltd., Montreal, Que., Cobalt, Ont., Winnipeg, Man., Vancouver, B. C.

A study of these tests will soon be undertaken. Meanwhile a detailed study of the following tests has been undertaken: Total cellulose, alpha cellulose and the lower celluloses, lignin, pentosans, resins.

Formaldehyde—Cellulose Reaction—The results of Ross's work on this reaction were referred to as disappointing. It was felt that the present organization was under a definite pressure to produce data that could be readily assimilated by the industry. The work might not produce such data, but the odds appear to be against it at this time.

The remainder of the report was concerned with a study of work on the estimation of alpha cellulose, the solubility of pulp in sodium hydroxide solution and the evaluation of pulp by means of the copper number. Work was also done on the baryta resistance of pulps and the estimation of cellulose in wood. A complimentary copy of the work on alpha cellulose had been sent to Prof. Carl. G. Schwalbe, who makes frequent reference to the work of J. H. Ross, though nothing is available in print concerning it.

Investigations Under Way

Many divisions of the work conducted by the institute were covered in the report of the Administrative Committee, and at the suggestion of Chairman Buncke, E. P. Cameron gave an outline of the work and its present status.

Mr. Cameron stated that the principal work at present being considered consisted of investigations on groundwood and sulphite. The work actually in hand was concerned with methods of analysis. This was a problem the laboratory staff had always with them and there was sufficient work to keep the staff busy for a long time.

Equipment of the Research Institute

W. G. MacNaughton discussed the equipment of the Research Institute, particularly the manufacturing side, and was of opinion it could not be improved upon. There was a complete papermaking machine, complete groundwood equipment, almost on a commercial scale, pulpmaking equipment and the equipment for studying the mechanical preparation of the stock for paper machines. It represented, he said, a group of apparatus on which many commercial problems could be studied.

Mr. MacNaughton suggested that mills that had graphed the results of studies by their own technical men should contribute the findings to the Research Institute for analysis. In that way, many of the results might be shown to be lacking in conclusions; in other cases valuable leads might be obtained for more detailed and better controlled operations in the Institute. It was difficult in mills, he said, to control all the variables.

Relics of a Bygone Age—Mr. MacNaughton characterized the beater as "an entirely obsolete piece of machinery", and the two fine beaters in the basement of the Institute were, in his opinion, relics of a past age, though admitting that the beater as well as other old forms of apparatus and methods would long continue in use. He said that papermaking was now a continuous performance and instead of producing pulp and paper as at present in a batch process, studies should be conducted with a view to removing the intermittent treatment and bring the stock preparation into a continuous process, the same as the papermaking machine itself. He wanted to know what was the sense of thickening the pulp from three-quarters to half density up to three or four per cent and then thinning it down again. Why not pass the pulp over the pulp screen and add it direct to the paper machine? Investigations of that kind could be worked out conclusively in the Research Institute with the help of the technical men in the paper industry.

Chairman Buncke then asked Dr. John S. Bates to discuss the subject, who complied by making a plea for the co-operation of technical men in the industry with the work of the Research Institute.

Appreciation of Hibbert and Cameron's Work

At the suggestion of the chair, a motion was made by A. Papineau-Couture expressing the appreciation of the Technical Section for the splendid work toward the completion of the Institute done by E. P. Cameron and Dr. Harold Hibbert.

Report on Chemical and Physical Standards

E. P. Cameron was then asked to present the report of the Committee on Chemical and Physical Standards. He said that the aim of the committee during the past year had been to establish a standard method for determining the initial strength of pulp with a view to international standardization. He reviewed the efforts that had been made by a committee of T. A. P. P. I. under the chairmanship of Mr. Rothchild to formulate a tentative standard method.

Mr. Cameron quoted from a letter received from Arthur Baker, chairman of the Pulp Evaluation Committee of the British Paper Makers' Association. The British committee had decided that a round sheet machine was preferable to the rectangular or square types. The area had been fixed at 200 sq. cm. He gave details of basis weight of test sheet, method of couching, pressing, etc. The use of a pebble mill in the preparation of the stock had been abandoned, because of difficulties in the way of standardization of pebbles, and wear of the jar and ash in the pulp.

The report was adopted on motion of R. S. Kellogg.

West's Bibliography

J. N. Stephenson reported for the Publication Committee of which Roy Campbell was chairman. He called attention to the publication of Dr. Clarence J. West's "Bibliography of Pulp and Paper Making, 1900-1928", a volume of 1,000 pages priced at $10.

Progress of Vacuum Drying

The Committee on Power and Drying, E. B. Wardle, chairman, was then called for. In reference to progress in vacuum dryer sections, Mr. Wardle said no detailed information was available at present. The wet end of the machine at the Price Bros. mill in Kenogami was being changed over and the two new 234-inch machines at Riverbend were now being assembled. A Minton Vacuum dryer for a high speed tissue machine was under construction in the United States and a vacuum dryer for a 100-ton pulp dryer was being built for another mill in Canada.

Mr. Wardle reminded the gathering that T. A. P. P. I. had awarded Mr. Minton the association medal and he suggested that the Canadian Technical Section make some similar recognition of his achievement, which constituted an advance in the art of papermaking second only to the fourdrinier machine itself.

Survey of Paper Drying Proposed

In the discussion which followed the presentation of the report, Mr. MacNaughton said it would be desirable to make a preliminary survey of paper drying, even if a complete test could not be carried out. It was well understood by engineers, he said, that drying of paper or pulp was nothing more than evaporating water, and if a mill knew how much water per hour had to be evaporated, a reasonable figure could be assumed on the theoretical amount of steam required to evaporate that water. The quantity of steam actually used could then be measured and a rough calculation made. Such an investigation would be a surprise to many mills as regards the waste of heat used at the present time.

Rubber Press Rolls

Mr. MacNaughton touched also on the need of study of pressing equipment, especially with regard to the use of a soft rubber press roll. He suggested a perusal of the report published by F. C. Huyck & Sons, by which it would be seen what a great difference there was between the saving on felts by using soft rubber rolls, and increased economy from the use of hard rubber rolls in removing water from the sheet.

Mr. Wardle subsequently reported on Engineering Standards.

An inquiry by a member as to a Safety Code brought out the information that the National Safety Council had developed a code for saw mills and woodworking establishments and a general code for the safety of power transmission lines.

Mr. Costigane, vice president of the National Safety Council, said that copies of the codes could be had from the council for the asking.

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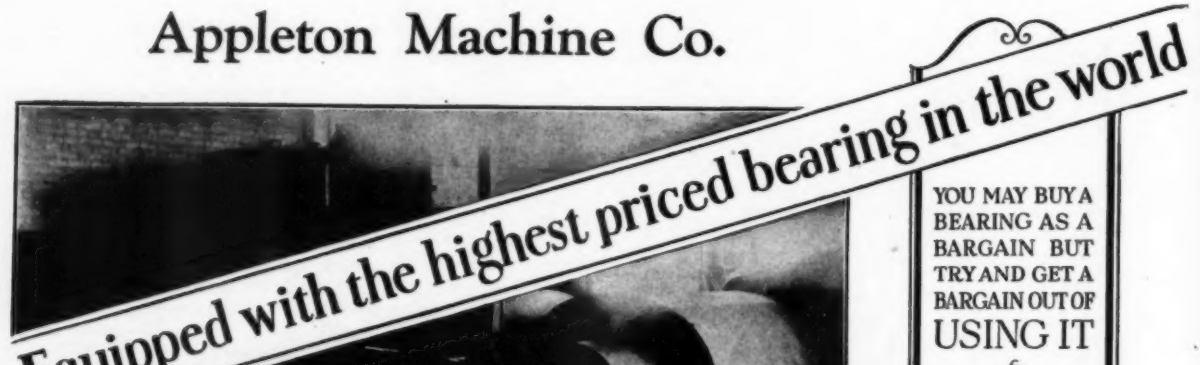
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Technical Service Council

For the Technical Service Council, an engineering body not directly connected with the Canadian Pulp and Paper Association, Colonel Smythe, director, outlined the purposes of that body, which had for its chief function the placing of graduate engineers. He suggested the compilation of a leaflet showing the opportunities that exist in the pulp and paper industry for young men.

Chairman Buncke said it would be of interest to learn some of the difficulties that had been met by the Technical Service Council in filling vacancies.

Shortage of Mechanical Engineers—John Stadler said he would be remiss in his duty if he did not say something concerning the excellent work done by the council. It was a clearing house where lost motion had been eliminated and the Technical Service Council was actually accomplishing more than the Engineering Institute. In reference to an alleged shortage of mechanical engineers, which had been mentioned by Chairman Buncke, Mr. Stadler questioned if there was a real shortage and intimated that the mechanical engineers were selling their services too cheaply. He counselled delay on their part in accepting positions.

Training for the Industry

R. G. Macdonald, secretary of T. A. P. P. I., described briefly the methods of training young men for work in the paper industry during their school terms, giving some particulars of the T. A. P. P. I. training program developed by Allen Abrams as chairman of the T. A. P. P. I. Committee on Training for the Industry.

T. L. Crossley gave excerpts from the committee's report to the association regarding the employment of University graduates. He said that both the University of Toronto and McGill University gave a series of lectures on pulp and paper every year.

Progress of the Text Books

At the suggestion of Chairman Buncke, R. S. Kellogg gave the following statement of the textbook fund for the joint executive committee on Vocational Education of which he is the secretary:

TEXTBOOK FUND

Assets, January 1, 1928	$1,085.75	
Securities January 1, 1928	6,934.74	$8,020.49
Receipts, 1928		
Royalties	$1,327.05	
Gain on bond sold	28.00	
Bond interest	292.50	
Bank interest	10.57	1,658.12
Total		9,678.61
Expenses, 1929		
Revisions, Vol. IV	$1,023.70	
Revisions, Vol. V	831.99	
Editor	480.00	
Promotion	198.73	
Travel	146.00	
Miscellaneous	59.50	2,739.92
Assets, January 1, 1929		
Cash	985.20	
Securities	5,953.49	$6,938.69

TEXTBOOK SALES

	During 1928			Total to Date
	Bound	Loose	Total	
Vol. I	251	11	263	3,573
Vol. II	184	62	246	2,851
Vol. III	503	47	550	5,299
Vol. IV	537	22	559	4,189
Vol. V	216	29	245	3,036
	1,691	171	1,863	18,948

On motion of E. B. Wardle the meeting passed a special vote of thanks to Mr. Kellogg.

Abstracts of Literature

Continuing the reports of committees, J. N. Stephenson, chairman of the Committee on Abstracts, gave figures pertaining to the number of words exchanged with the United States Committee. He said that he as chairman would welcome criticisms of the work from members.

Details of Reorganization

Under new business, Mr. Stephenson gave a resumé of the changes of by-laws governing membership on the Council. These are treated in the report of the chairman on another page. He commented particularly on the new arrangement providing for the election of councillors, two for three years, two for two years and one for one year. The advantages of this in providing continuity of service by increasing both terms of office and numbers of councillors were touched upon by John Stadler who reminded the gathering that it took a new council three or four months to get going. The addition of a technical engineer-secretary would lift a burden from the shoulders of the chairman.

Co-ordination of Effort with the Institute—Dr. John S. Bates asked if the appointment of a technical secretary would be decided soon. He was of the opinion that research work should have precedence. He considered it an advantage for the Technical Section and Research Committee to be a part of the general association and not a separate organization as it is elsewhere. The Cellulose Research Institute was a part of the main association and the Technical Section should always strive for co-ordination of effort with the Research Institute.

Chairman Buncke said he anticipated no conflict with the Research Institute on the part of the Technical Section—the two would be closely knitted together.

Offer by the News Print Service Bureau—R. S. Kellogg considered the action taken by the Technical Section that morning as a pleasing indication of the progress of the association. He said that the News Print Service Bureau of which he was the secretary did a great deal of technical work for the industry and was desirous of offering its services to the Research Institute. The News Print Service Bureau would be glad to be called upon for a representative on the Council.

Proposed Index of Patents—R. G. Macdonald, secretary of T. A. P. P. I., asked the advice of the Section with regard to the publication of books by the Technical Association of the Pulp and Paper Industry. He said that Dr. Clarence J. West was considering the compilation of an index of patents and he was seeking advice as to the desirability of publishing such a work.

Mr. Thorne suggested that the matter be referred to the Council for consideration. Mr. Stadler, Mr. Couture, and Mr. Wardle all expressed the opinion that the compilation of such a work would involve more expense than the results would justify.

This concluded the business of the forenoon session.

PAPERS AT AFTERNOON SITTING

The afternoon sitting was devoted chiefly to the reading and discussion of papers. One of the papers on "Tearing of Newsprint", by Dr. J. Campbell, of the Abitibi Power & Paper Company, was omitted for special reasons. The order of presentation of papers was changed in some particulars, but Dr. Emil Heuser opened the proceedings, according to program, with a "Review of the Sulphite Process", a paper of great interest and some historical value.

Development of Sulphite Process

Doctor Heuser introduced the subject with a comment on the increased production of woodpulp and groundwood in all countries since the great war, an increase that had not, however, been marked by any great technical development. There had been a steady evolution based upon the original discoveries of pioneers like Tilghman, Ekman, Mitscherlich, Ritter-Kellner and others, sixty to seventy years ago. He asked why it was that new or revised processes, such as the chlorine process, the nitric acid process and similar inventions found only limited interest, whereas the two main

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pulping processes—the sulphite and the soda process—were in general use. His own explanation was that these processes are satisfactory and difficult to improve. According to Doctor Heuser, Tilghman, the inventor of the sulphite process, made a lucky strike in hitting upon sulphurous acid as a solvent for the noncellulose constituents of wood. Tilghman did not know why this acid was so suitable, because at that time little was known about the chemistry of lignin. Today, however, we know that this acid is one of the very few that form a well defined chemical compound with lignin. Tilghman happened to hit upon the right thing at once and his invention revolutionized the pulp manufacturing industry, for at that time only the soda process was known.

The Progress of Invention—Doctor Heuser reviewed the progress of invention in acidmaking, the preparation of the wood, digesters, gas and heat recovery, pulp dryers, chemistry of the cooking process, semipulp processes and the search for raw materials other than coniferous woods.

Among the improvements in recovery processes, the Decker system was mentioned. Instead of cooling the relief (gas and liquor) from the digester and using it in the reclaiming tank for building up the cooking acid, it is injected hot into the bottom of a freshly filled digester. In this way, first, the heat stored in relief gases and liquor is utilized for raising the temperature in the digester; second, the SO_2 is absorbed. It is said that by this system the chips are cooked more uniformly and the yield of pulp is greater than by the ordinary system.

Sureth Recovery System—The Sureth process of recovering heat and SO_2 received comment. Instead of relieving gas from the top, a certain amount of cooking liquor is drained from the bottom of the digester. It is asserted that in this way the drained cooking liquor carries with it the same amount of SO_2 as is recovered by top relief. A saving of steam results as a smaller volume of liquid has to be heated.

Stebbins Recovery System—The heat recovery system of the Stebbins Engineering and Manufacturing Company resembles in some respects that of the Waldhof system used in Germany. The relief from the digester is not cooled, but is absorbed by fresh cold cooking acid in an accumulator under pressure in order to obtain the full benefit of the heat and the surplus SO_2. As distinguished from the Decker process, all reliefs in the Stebbins system are absorbed in a closed container under pressure, and in this way the waste of heat and SO_2 involved by blowing out under full pressure into the blowpit is avoided. Doctor Heuser also referred to the Stebbins acid accumulator system invented by T. L. Dunbar whereby the chips are cooked by circulation of a mixture of fresh cooking acid and spent liquor until the acid is exhausted of SO_2. Preheated fresh acid is added from time to time to the cooking liquor in the digester and the cooking continued without relieving. In this way pressure is raised without a corresponding increase of temperature. When the cook is finished, the liquor is drained from the pulp into a spent liquor tank, half of it being returned to the system, the other half going to the sewer, unless it may be used in conjunction with a sulphate mill.

Doctor Heuser was not sure whether it was desirable to return such considerable amounts of spent liquor to the cooking acid as were provided by systems referred to. In this regard the systems might be wrong in principle.

Reclamation of Waste Liquor—A satisfactory method of recovering heat and gas from the blowpits or the vomit stacks has yet to be found. He did not think that any of the methods ordinarily used for the recovery of waste liquor were satisfactory and doubted the advisability of using it as fuel. The precious organic matter of the waste liquor should not be burned, but be transformed by chemical processes into valuable chemical products. The final solution of the problem will be revealed when the nature of lignin is determined. Chemical research on this is being conducted in a number of laboratories throughout the world.

The Grewin Drying System—Among paper and pulp drying systems, that of the Swedish engineer Grewin was mentioned. This system, which may be regarded as a development of the Briner vapor absorption system, blows preheated air through the spaces between cylinders and felts and the pulp sheet at high speed. The air, saturated with moisture, is removed very quickly. The Minton vacuum drying systems came in for mention, as did also, what Doctor Heuser described as the newest system of pulp drying as accomplished in the Fidalgo dryer, an apparatus which applies heated air to the pulp in shredded form.

Neutral Sulphite Processes—Referring to processes of cooking in which calcium or magnesium is replaced by other bases, Doctor Heuser called attention to the Keebra process, which he said was one based on suggestions made many years ago by Viggo Drewsen and L. J. Dorenfeldt. This process uses sodium sulphite and is supposed to be well adapted for pulping resinous woods if caustic soda is added. The idea of adding caustic soda to sulphite liquor was put forward many years ago by Willie Schacht. The main difficulty of these processes was the recovery of chemicals. The Alfthan-Serlachius process where only a small amount of alkali is added to the sulphite cooking acid is apparently an exception to the rule, because recovery is unnecessary. This process is said to be especially suitable for the pulping of jackpine and southern pine.

Higher Cellulose Chemistry

After expressing the thanks of the Section to Doctor Heuser, Chairman Buncke called for the next paper and at the suggestion of Doctor Hibbert, Dr. G. I. Hoover gave a summary of a paper by himself and K. W. Hunten on the action of sulphurous acid on aldehydes and the liberation of lignin. In the cooking process calcium and magnesium salts of ligninsulphonic acid are formed. The assumption of Klason that lignin is a polymer of coniferyl aldehyde made it desirable to investigate unsaturated aldehydes in studying the mechanism of the reactions involved in the manufacture of sulphite pulp. As a contribution to this study, the electrical conductivity of a number of aldehyde sulphonic acids had been determined at different concentrations and at temperatures from 18° to 150° Cent. The reseults obtained served to confirm the views previously expressed as to the probable strength of such acids.

A Trade Secret—A good discussion ensued but of a restricted and highly technical character. Doctor Hibbert called attention to the fact that neither in his paper or subsequent discussions had Doctor Heuser told the section how to make sulphite pulp. It was evident that this is a carefully guarded trade secret. But there was no reason why others should not make as good a pulp as Riordon pulp.

The Wood is the Thing—The first question to be considered was the wood. Was it best to use wood in the green state or seasoned after storage. It was the resin in the wood that caused trouble, for this underwent change by oxidation. Then there was the question of the correct method of chipping wood. On what, he asked, was the present method of chipping wood based. Was it because Ritter or Mitscherlich chipped it in that way forty years ago, or was it founded on a scientific basis.

Is Our Wood Chipping Scientific?—Doctor Hibbert suggested that the method of chipping wood should be based on botanical knowledge of the penetration of wood by liquids. It was certain that a shorter cooking time would follow better penetration of wood by the cooking liquor. Dr. Bjarne Johnson took part in the discussion at the suggestion of the chair. He said he was glad that Doctor Heuser had mentioned the work of Haegglund so appreciatively because Haegglund had done great work in cellulose research. One of the observations made by Haegglund was that it was practically impossible to dissolve lignin in the absence of sugar. He asked if Doctor Heuser could account for this and Doctor Heuser replied that he had never heard of Haegglund having made this observation. It was news to him that sugar had any influence on the solubility of lignin.

W. E. B. Baker inquired if Doctor Klason's views regarding the existence of two lignins—alpha and beta—would not affect certain conclusions that had been reached, and was told that Klason's statements had not been generally accepted, whereupon Doctor Heuser observed that an investigation carried out by Hibbert and Hoover might settle the

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question as to whether there was more than one kind of lignin.

George H. Tomlinson observed with regard to the statement attributed to Haegglund that it was impossible to dissolve lignin in liquors where no sugar was present, that he had made a number of cooks in which the sugar had been removed and found it had no influence on the yield.

New Relief System

The last paper on the afternoon program was one entitled "Hot Acid Accumulator", the author being A. D. Merrill, of the Stebbins Engineering and Manufacturing Company, who demonstrated the steam saving and increased gas recovery made possible by the method of coupling up digesters and absorbing relief gases and liquor in an acid accumulator. He spoke of the process as a "chemipulp heat, gas, and liquor recovery and cooking process". The acid accumulator is interposed between the acid storage tanks and the digesters so as to recover the hot gases and liquor without cooling. In recovering by this method the advantages were said to consist of steam saving, increased yield, and increased gas recovery with a resulting stronger acid.

In the discussion which followed, Mr. Thorne observed that a similar system of saving steam had been used in Sweden. He was of opinion that it was fundamentally wrong to use waste liquor in making pulp.

A member who had used the system said that the yield was not greatly exceeded and there was no saving in sulphur, but a satisfactory pulp was produced.

John Stadler said that Mr. Merrill's paper had a considerable merit and it would be interesting to get the opinions of those present regarding the reuse of spent liquor. He thought that the arrangement described would not provide uniformity of acid. Mr. Merrill replied to this by saying that with a large accumulator such as is used in a certain Wisconsin mill greater uniformity of acid strength would be obtained than under the old system.

The attendance at the afternoon sitting taxed the capacity of the hall and a number of members and visitors were obliged to stand against the wall. Chairman Buncke explained that such a large attendance had not been expected and that if it continued at subsequent sessions a larger hall would be used. There were 170 present.

CLOSING SITTING

At the morning sitting on Thursday, January 24, George Carruthers presiding, a "Progress Report on Fundamental Scientific Research" was presented by Dr. Harold Hibbert, of the Research Institute.

Research Problems

Doctor Hibbert said that the problem selected two years ago for a joint co-operative research program was that of the manufacture of sulphite pulp and he would give a brief account of the progress made. He said the problem embraced three main lines of investigation, as follows:

(a) The physical and chemical properties of the cooking liquor;
(b) The structure of the constituents of wood, viz. cellulose, lignin, pentosans and resins;
(c) Possible utilization of sulphite liquor.

Cooking Process—Complete data on the subject of concentration and temperature for sulphite acid liquors used in cooking were under investigation with a view to determining the nature of the reaction by which lignin is extracted from wood. It was realized that while nothing was definitely known concerning the constitution of lignin, sufficient evidence was available to indicate the presence of an aldehyde, or an ethylene linkage, or both. Assuming this to be true, it was deemed desirable to investigate the nature of the reaction between solutions of sulphurous acid and simple saturated and unsaturated aldehydes.

Doctor Hibbert said that the results were to be communicated by Doctor Hoover, but there still remained the question of a careful plotting of the temperature-pressure diagrams for an actual sulphite cook.

He mentioned other problems under study on the correct answer to which would depend a better knowledge of the utilization of sulphite liquor, the proper method of the bleaching of pulp and the possibilities of new methods of manufacturing pulp.

Doctor Hibbert said that an important investigation was in progress on the nature of the resins in jackpine and spruce, by which it was hoped that light might be thrown on the causes of "pitch trouble".

Progress on the studies mentioned and such investigations as those relating to the hydration and swelling of cellulose; sizing, etc., were being held over pending the appointment of adequately trained workers in the fields of colloid and physical chemistry.

Machine Room Ventilation

The regular program was then taken up and T. J. Higgins, vice president and general manager, Ross Engineering of Canada, Ltd., was introduced to present his paper on "Air Systems for the Machine Room and Effect on Overall Thermal Efficiency". Printed copies of this were available containing illustrations of Briner economizers and Grewin air control systems, which were referred to in the subsequent discussion.

Economical Methods of Drying Paper—Mr. Higgins spoke of the wide variation in the quantity of water evaporated per ton of paper at different mills. He said that the removal of water by mechanical means at the wet end of the paper machine was the most economical method. Recognition of this has led to the introduction of numerous improvements in that part of the paper machine. One of the initial steps that should be taken to effect economies in drying was the correcting of conditions where the drying problem includes evaporation of water that might be more economically removed by mechanical means.

Figuring Steam Used for Drying—Referring to the amount of steam required to dry a given amount of paper he said that it was difficult to obtain accurate figures. The practice of attributing steam consumption to tons of saleable paper produced was not a correct method, as account was not taken of the amount of trim and broke also dried. When a wide machine is required to trim to a width that is not economical for the machine width, the trim alone has been known to amount to ten or twelve tons a day, exclusive of broke. While figures obtained in this way might be correct for cost accounting they needed correction and adjustment where the determination of drying efficiency was concerned. Other sources of error were mentioned. Thus, steam attributed to the drying operation often included steam for heating of air that could be heated by waste vapors or steam to calenders, or for general heating purposes. Again, steam is often credited to the drying operation when it is only used in handling condensate.

Consideration of Individual Factors—The factors occasioning drying steam requirement were enumerated by Mr. Higgins as follows:

(a) The heat absorbed by the evaporation of water from the water circulated in formation of the sheet on the wet end of the paper machine.
(b) The sensible heat to raise fiber from the temperature at which it enters the dryers (70°) to the temperature (200°) at which it leaves dryers.
(c) The sensible heat to raise the water from the temperature at which it enters the dryers (70°) to the evaporating temperature (180°).
(d) The latent heat to evaporate the water in sheet at 180° F.
(e) The heat required for the heating of machine room and machine room basement or radiation losses from the building.
(f) The sensible heat to air over and above that theoretically required in the distribution of heat required, and in conveying the water vapor from wet ends and drying cylinders out of the building.

Mr. Higgins gave detailed explanations of the factors enumerated, and sectional views were shown of a typical air heating economized unit; views of machine rooms in modern Canadian mills were also shown to illustrate his paper. Graphs and charts accompanied the paper to illus-

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trate the efficiency of the systems described, which included Briner economizers and the Grewin air control system. The costs of these were indicated by graphs.

Efficiency of the System—The important thing about Mr. Higgins's paper and the one which attracted considerable attention was the estimated efficiency of the systems described. With an improved wet end and air system as described in the paper, the overall thermal efficiency was stated to be 95 per cent, while the amount of steam taken to dry a ton of paper by the methods described amounted only to 5,000 lb., which indicated remarkable efficiency.

Completely Enclosed Machines—Referring to the use of the Grewin system, W. G. MacNaughton said he had seen this in operation at Holmens Bruks in Sweden, where hoods were carried down to the floor at both wet and dry ends of the papermaking machine. He inquired of Mr. Higgins if he thought the tendency in this country was in the direction of complete enclosure of papermaking machines in that way. The author of the paper said it was, but that it would be necessary to adopt some means of recovering waste heat in order to get the best results.

Penetration of Woods by Liquids

H. W. Johnston gave a summary of progress work carried out in the Department of Physical Chemistry on the penetration of wood by vapors and liquids. He showed several sectional views of wood substance to illustrate the passage of sap in the tree. The investigations had not been completed, though definite experimental values had been obtained which would be published after they had been thoroughly confirmed. The investigation was being made under the direction of Prof. O. Maas, of McGill University, assisted by H. W. Johnston and Mr. Pidgeon. Mr. Johnston's investigation covered the rate of flow through wood sections of water and neutral and acid sulphite solutions and sulphuric acid, respectively. Mr. Pidgeon's work showed that wood absorbs a definite amount of vapor in a perfectly reversible manner, and he has measured the rate of penetration of a vapor into wood.

Professor Goodwin, of Queens University, mentioned that in his laboratory work was going on with a view to increase the speed of reaction between the aldehydes and bisulphites in the sulphite cooking process.

"To Revamp or to Rebuild"

The succeeding paper by B. M. Owen and R. B. Elliott bore the title "To Revamp or Rebuild". It was presented in abstract form by Mr. Owen, who gave an example of the reconstruction of an old newsprint mill. Many mills, he said, throughout the country, both old and new, were unable to show how the steam power was distributed, no charts or diagrams being kept.

The lesson of the paper consisted in impressing on executives, engineers and operators the necessity of very complete investigation before coming to a decision as to rebuilding or revamping. Mr. Owen favored rebuilding and so did a number of the men who listened to him.

Returns on Investment—John Stadler made an interesting contribution to the discussion. He said that the paper had reference to one of the rare instances in which commercial investment was exceeded by the returns and it taught the lesson that when one sets out to do a thing he should stick at it and be sure above all things to get a return on the money invested in the enterprise. It was rare to find people selling equipment who could tell one much about the savings to be accomplished through the adoption of new methods, processes or equipment. Mr. Owen's paper should fill a long-felt want, he said, and cover up a hole that has remained uncovered for a long time. "Whether you rebuild or revamp it is requisite that you make up your mind and do it no matter what anybody else says to the contrary".

Luncheon of the Technical Section

The annual luncheon of the Technical Section of the Canadian Pulp and Paper Association was held this year on Thursday, January 24, in the Ball Room of the Ritz Carlton Hotel, with Retiring Chairman Buncke acting as toastmaster. There was a large attendance to hear Dr. Wilder D. Bancroft, of Cornell University, speak on "Science and Cellulose." An unannounced speaker caused some amusement and brought considerable applause with the award of a set of books to the chairman of the Joint Vocational Education Committee.

Chairman Buncke had demurely enough called upon George Carruthers to introduce Royal S. Kellogg to the gathering, as Mr. Kellogg had some announcement to make concerning the Joint Committee on Vocational Education. Mr. Carruthers very graciously consented, and told with evident satisfaction how successful Mr. Kellogg had been in raising funds for the Textbook Committee.

Mr. Kellogg thereupon gave some particulars of the work of the Joint Committee on Vocational Education in the preparation of the textbooks, as well as details of the funds collected and the number of books sold. He styled the entire undertaking "A Venture in Optimism". The Joint Committee on Vocational Education has consisted of the same personnel from the beginning. Only one man on the committee had resigned and no one has died. During all this time, Mr. Kellogg said, the committee has had as its head a canny person named George Carruthers to whom he was now to present a complete set of the textbooks, bound in red morocco, and bearing a legend on the frontispiece, "Presented to George Carruthers, Esq., by His Associates on the Committee in Token of Their Appreciation of His Untiring Efforts as Chairman of the Joint Executive Committee on Vocational Education".

Mr. Carruthers was taken completely by surprise and could only bow his acknowledgments and express thanks confusedly.

Professor Hibbert was asked to introduce Professor Bancroft, which he did in interesting fashion by telling something of his career and accomplishments. Doctor Bancroft holds an honorary degree from Cambridge University and founded and carried on at his own expense for many years the **Journal of Physical Chemistry.**

Professor Bancroft gave an interesting account of the development of chemical research in the electrical industry, instancing the methods of the General Electric Company and the Westinghouse Company. He also spoke of the splendid results that had been obtained by the Brown Company, pulp and paper manufacturers, Berlin, N. H., through the encouragement of research work on the part of their scientific staff.

New Officers Elected

The election of officers to serve during the ensuing year was then taken up and the following slate proposed by the Committee on Nominations went through unanimously, the officers named being as follows:

Chairman—R. A. McInnis.

Councillors—To serve three years: C. B. Thorne, J. O. Mason; to serve two years, George H. Tomlinson and D. L. McLeod; to serve one year, H. J. Buncke and John Stadler.

After the customary acknowledgments and votes of thanks to outgoing officials, the session was adjourned.

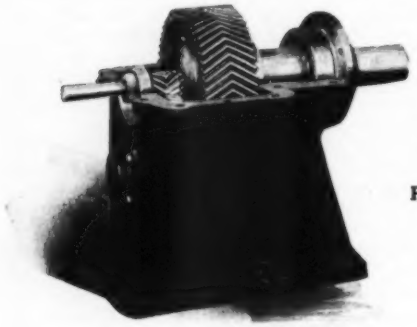
Cutler-Hammer Changes Name

Announcement has been made of a change in the name of The Cutler-Hammer Mfg. Co., Milwaukee, Wisconsin, manufacturers of electric motor control, wiring devices and allied lines. The new name of the company will be Cutler-Hammer, Inc.

The new company is organized as a Delaware corporation with the following officers: president, B. L. Worden, vice president, F. L. Pierce, vice president, J. C. Wilson, treasurer, H. F. Vogt, secretary, W. C. Stevens. The Board of Directors is composed of: F. R. Bacon, Milwaukee, Wis., chairman; F. L. Pierce, Milwaukee, Wis., B. L. Worden, West Orange, N. J., Carl A. Johnson, Madison, Wis., T. Johnson Ward, New York, N. Y., L. A. Lecher, Milwaukee, Wis.

In the change from a Wisconsin to a Delaware corporation The Cutler-Hammer Mfg. Co., Milwaukee, The Cream City Foundry Co., Milwaukee and Cutler-Hammer Manufacturing Company, New York are united under one name.

FARREL-SYKES SPEED REDUCERS



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10/1 to 130/1 Ratio

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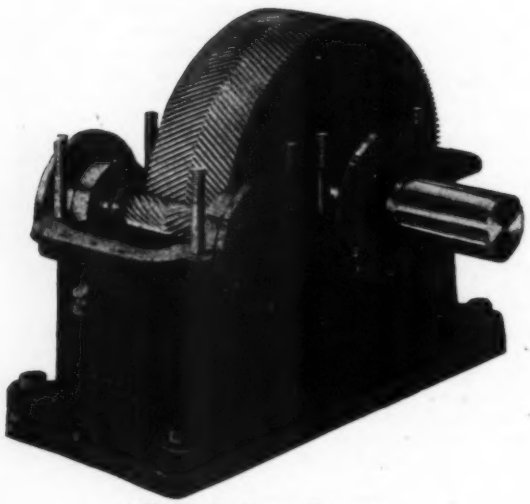
Mechanical efficiency 98.9 to 99%



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A complete series of right angle drive units
Ratios up to 100/1
Efficiency about 97½% to 98½%
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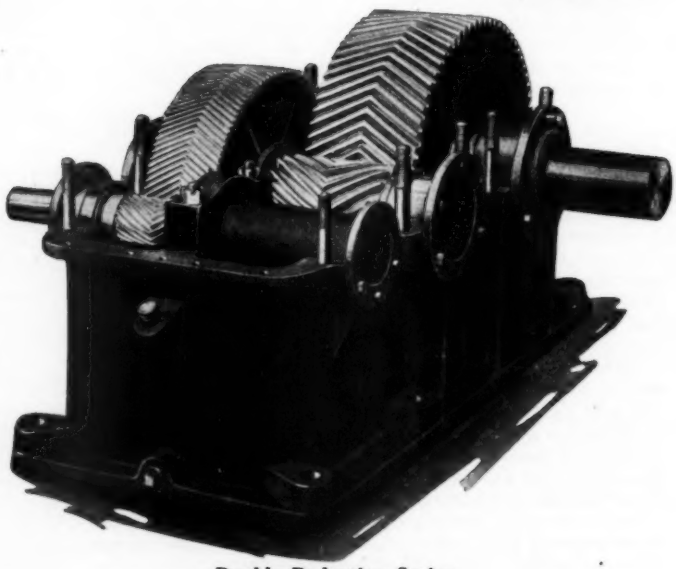
There are over sixty different designs of standard units suitable for transmitting any horsepower from ½ to 5000 HP in our standard series.

All of the gear units embody Sykes gears with continuous herringbone teeth and 30° helix angle, and represent the latest designs in speed reducers.

A new catalog containing details of the roller bearing type series may be obtained on request.

We suggest that you send details of your power transmission problems to us and obtain the benefits of our consulting engineer service.



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BUFFALO, N. Y., AND BIRMINGHAM IRON FOUNDRY OF DERBY, CONN.
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344 VULCAN ST., BUFFALO, N. Y.

Forestry Work in Canadian Mills

Woodlands Section of the Canadian Pulp and Paper Association Hear Papers Read on Forestry Topics and Perpetuation of the Industry

AT THE opening sitting of the annual meeting of the Woodlands Section of the Canadian Pulp and Paper Association held at the Ritz Carlton Hotel on Thursday morning, January 24, the retiring chairman, B. F. Avery, of the Abitibi Power & Paper Company, discussed the trend of forestry developments in the woods operations of pulp and paper mills. He gave the results of a questionnaire to which sixteen companies respond whose annual cut represented about 3,285,000 cords of pulpwood.

The answers showed that almost all of them have inventoried or were in process of inventorying wood resources; have balanced, or have plans for balancing, mill consumption with forest production on a sustained basis; are practising control in woods operations to reduce costs and perpetuate the stand; and have attained, or are progressing toward, adequate protection against fire. Three-quarters of them are indulging in forest research and have made some effort toward perpetuation of their stands through seeding and planting and a quarter of them have done something toward reducing loss through fungi and insects.

"My chief witness of the trend of development in woods operations," said Mr. Avery, "is a body of men in charge of woods operations, conscious of their responsibility, striving daily to reduce costs, and to perpetuate the industry in a profitable state."

Other papers read in the morning sitting were "The Seeding of Spruce", by Ellwood Wilson of Grand'Mère, and "The Trend of Logging Developments in Woods Operations", by P. C. Bryant, of the Yale School of Forestry.

At the official luncheon, Hon. W. A. Finlayson, Minister of Lands and Forests for Ontario, was the guest of honor. He said that forestry was so far advanced that it had become possible to put operations on a sustained yield basis, and that he looked to the forestry experts to devise the best methods by which this might be done. He regards regulation of forestry matters as a last resort, and thinks that the government should act as a fatherly mentor rather than as a dictator. He also made mention of the new saw mill at Blind River, Ont., which, he said, was the most up to date in the world.

Mr. Avery, in thanking the speaker, said that as the governments and the wood users are partners in their efforts to put woods operations on a sound basis, best results would be obtained by thorough co-operation between the woods department of the paper companies and the lands and forests departments of the governments.

Technical and Woodlands Sections Hold Joint Meeting

A JOINT meeting of the Technical and Woodlands Sections, reserved for members only, took place on Thursday afternoon, January 24, when the following papers were read and discussed: "Wood Consumption in Newsprint Mills," by Dr. John S. Bates, Price Brothers & Co., Quebec; and "Measurement of Wood Receipts at Mill," by C. W. Alden, Nashwaak Pulp & Paper Company, St. John, N. B. There was another paper on the agenda on "Woods Scale and True Costs of Wood," by W. G. Wright, Price Brothers & Co., Quebec, but this was withdrawn immediately prior to the meeting.

One of the lessons to be derived from the paper by Doctor Bates is that the golden mean holds good with regard to the behavior of different species and sizes of wood in pulping, as in affairs of human conduct. Very small wood gives poorer results than medium size blocks and extra large wood is also usually a disadvantage. Wood consumption in the pulp mill is affected by many factors, rotting, weathering and charring being among those enumerated. The true measure of wood consumption in a mill is that of actual weight and the development of continuous automatic weightometers will be watched with interest. In the meantime it was suggested by Doctor Bates that mills should be careful to make periodic tests on the weight basis, partly for the benefit of establishing percentage yields of pulp from wood and partly for the purpose of relating volume of wood to weight of wood.

The volume of wood has a definite bearing on wood value and is not likely to be displaced altogether by the weighing of wood. True volume can be determined by immersion of the wood in water to measure displacement, but this method is practically limited to periodic tests of blocks. Scaling is the method of universal application. The cord is another indirect volumetric measure of wood; this varies 10 per cent daily, as Doctor Bates said, "with the whims of nature and man". The paper was accompanied by a set of calculations of wood consumption in two newsprint mills.

The paper by Chester W. Alden represented a compilation of opinions and descriptions of methods used by operators in different mills. These made it apparent that the problem of computing accurately the quantities of pulpwood used in the mill and of relating woods measurements on which the cost of pulpwood is based was a complicated one. A universally workable measurement of wood is something greatly to be desired.

Joint Annual Dinner

In the evening, at the Ritz Carlton Hotel, the Technical Section and Woodlands Section members came together again at a joint annual dinner. There were no set toasts or speeches at this dinner and the evening was given over to a delightful entertainment, with a musical program of unusual excellence, accompanied by dancing, singing and vaudeville performances.

Committees for Annual Supts. Meeting

Arrangements are being formulated for the Tenth Anniversary Convention of the American Pulp & Paper Mill Superintendents Association to be held at Wausau, Wis., June 6, 7 and 8, 1929. R. H. Kelly, general superintendent of Marathon Paper Mills Co., Rothschild, Wis., is general chairman of the convention, and Fred C. Boyce of the Wausau Paper Mills, Wausau, Wis., will act as honorary chairman; Wallace Shymanski is secretary.

The chairman has appointed the following committees: **Finance**, P. M. Wilson, chairman, N. S. Stone, T. L. Edmonds; **Entertainment**, E. M. Bassler, chairman, H. A. Skinner, N. H. Foley; **Transportation and Mill Visits**, Grover Keeth, chairman, G. H. Urban, W. E. Payne; **Publicity and Advertising**, R. H. Kelly, chairman, Wallace Shymanski; **Program and Arrangements**, F. L. Zellers, chairman, Vassie Atherton, George Voight; **Registration**, Allen Abrams, chairman, W. R. Winn, Judson P. Smith; **Ladies Committee**, Mrs. D. C. Everest, chairman, Mrs. R. H. Kelly, Mrs. Grover Keeth, R. H. Altman, C. H. Noble.

The Divisional Meeting Chairmen are: **Chemical and Mechanical Pulp**, Victor E. Fishburn, C. F. Burgess Laboratories, Madison, Wis.; **Book and Fine Papers**, James G. Ramsey, The Jessup & Moore Paper Co., Wilmington, Dela.; **Board and Coarse Papers**, Tom Harvey, The Gardner & Harvey Co., Middletown, Ohio; **Superintendents Mill Service Committee**, K. E. Terry, S. D. Warren Co., Cumberland Mills, Maine.

Mr. Kelly, chairman, would like to have all suggestions as to what subjects would be of interest to the pulp and paper mill superintendents sent to him immediately. Hotel reservations will be taken care of by Wallace Shymanski, secretary. All reservations for hotel accommodations should be addressed to him care of the Hotel Wausau, Wausau, Wis.

Eighteen 12 plate Barker International Diaphragm Screens have been installed by the Consolidated Water Power and Paper Company in its new pulp mill bleach plant at Wisconsin Rapids, Wis. These screens were furnished by the Green Bay Barker Machine & Tool Works, Green Bay, Wis., and are built for battery installation, each row having a continuous vat and continuous flow box. Five flat cars were required to make the shipment.

Another Record of Performance

A 36" 8-Ply Cincinnatus Belt. The main drive at the plant of the Franklin Board and Paper Company, Franklin, Ohio.

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THE BELT THAT STAYS TIGHT

Brute strength combined with great flexibility make Cincinnatus an outstanding belt for all paper mill drives.

Each ply of the special weave hard duck in this belt is separated from the other by a layer of rubber. This feature provides for great flexibility.

With 50% less stretch than the ordinary belt, due to special weave of duck, Cincinnatus stays tight on the pulleys, practically eliminating take-ups and relacing.

We will be glad to consult with you on your special requirements.

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CINCINNATI OHIO

The Month at Washington

THE advisability of purchasing paper directly from contractors for use in government activities outside of Washington is being investigated by the office of the Chief Co-ordinator, who is obtaining information as to the quantity of paper used annually in the field offices by classes or kinds and sizes; the number of distribution points to which shipments are made from the paper mill, contractor or jobber; the specification used; the price paid per pound f.o.b. mill or delivered the total annual expenditures made for paper by printing plants of the government outside of Washington.

Senate to Make Inquiry Into Paper Monopoly—Investigation into allegations that a group of foreign paper manufacturers is seeking to purchase control of daily newspapers in the United States for the purpose of inducing publishers to make long-term contracts for purchase of newsprint was demanded by Senator Schall of Minnesota who introduced a resolution (S. Res. 292) calling for the appointment of a select committee to make the investigation.

Senator Schall also introduced another resolution (S. J. Res. 200) to provide a bounty for the encouragement of the manufacture of newsprint paper from the waste products of field crops produced on American farms, for the purpose of further developing the papermaking industry of the United States which is now dependent principally upon foreign countries for an adequate supply of the pulp and paper used in the industry.

Other Congressional Activities—Congressman Cramton introduced a bill to establish uniform requirements affecting government contracts (H. R. 15713), to be known as The Public Contract Act of 1929. This law, if it becomes effective, will affect the present method of government purchases. It sets out a complete plan of procurement, advertising, contract awards, forms of contracts, bonded security for performance, hours of labor of those employed in producing government contracts, the use of domestic materials in preference to foreign production, and repeals many of the present provisions of the U. S. Statutes.

Congressman Hull introduced a bill (H. R. 15739) to provide for a 1-cent postage rate on all local letters and to expedite the handling of that class of mail matter.

Trade Marks—The Pan American Trade Mark Conference meets in Washington February 11th to consider the problem of inter-American protection of trade marks.

Federal Standards—The Federal Specifications Board has just issued a revised alphabetical index and numberical list of government master specifications (Circular No. 371). This is the work of 75 technical committees and covers nearly 600 different specifications.

Glossary of Paper Terms—For guidance in properly listing and classifying export of paper and paper products on shippers' export declarations, the Bureau of Foreign and Domestic Commerce has compiled a new "Glossary of Paper Terms and Instructions to Exporters," a copy of which may be had free upon application.

New Rates on Newsprint Suspended—By an order just entered in I & S Docket No. 3226, the Interstate Commerce Commission has suspended until August 19th the operation of certain schedules proposing to reduce the rate on newsprint paper in carloads from New Orleans to Shreveport and other points in Louisiana, on import and coastwise traffic from 38.5 to 27c per 100 pounds.

Interstate Commerce Rulings—The rate on waste or scrap paper, in carloads, from Oxford, Conn., to Middletown, Ohio was found not unreasonable in a recent decision by the Interstate Commerce Commission (No. 20203).

Rates on fiberboard, pulpboard and strawboard corrugated boxes, knocked down, in carloads, from St. Louis to Denver, and points taking the same rates, were found not unreasonable or unduly prejudicial and the complaint was dismissed (No. 19491) in another decision.

In Hamersley Mfg. Co. vs. Erie R. R. Co., No. 16531, the commission found that shipments of imported wood pulp in carloads from Hoboken to Garfield, N. J., were subject to its jurisdiction, and that the rate was unreasonable, a reasonable rate being prescribed for the future and reparation was awarded.

In Waverly Paper Board Co. vs. Boston & Maine R. R., No. 19159, it was found that the rate on chip board and news board, in bundles, in carloads from Waverly, N. J., to certain cities in Massachusetts, was not unreasonable, unjustly discriminatory or unduly prejudicial, and the complaint was dismissed.

Recent Customs Decisions—The rate of duty to be assessed on transparent paper coated with gold leaf was recently decided in a ruling by the U. S. Commissioner of Customs in T. D. 43083, a copy of which may be procured by interested parties.

Merchandise made of papier-mâché, classified as manufactures of paper at 35 per cent ad valorem under par. 1313 of the tariff act of 1922 was claimed dutiable at 25 per cent under par. 1303, and the U. S. Customs Court in a recent decision upheld the contention (No. 295541).

Surface-decorated paper, classified at 4½ cents per pound and 17 per cent ad valorem under par. 1305, was claimed dutiable at only 4½ cents per pound under said paragraph, and the court also upheld this protest (No. 304064).

Recent Publications—"Pulp Timber Resources of Southeastern Alaska" is the title of Misc. Pub. No. 41, just issued by the Department of Agriculture, which shows that this section can become a great permanent papermaking region, as vast forests of pulpwood in the Tongass National Forest are to be managed by the Government for a never-ending production of timber. With excellent water power resources, tidewater transportation, and a climate that will permit yearlong plant operation and shipping, the region is a natural locale for a paper industry, and its future holds the possibilities of model industrial towns, modern plants, and a stable population of mill and woods workers. It is estimated that this section can produce a million and a half cords of pulpwood annually in perpetuity, enough for a million tons of newsprint.

"Market Research Agencies", a guide to publications and activities relating to domestic marketing (1928 edition) has just been issued by the Bureau of Foreign and Domestic Commerce as Domestic Commerce Series No. 6.

The annual report of the Bureau of Labor Statistics shows the progress made in workmen's compensation laws, summarizes the passage of new acts and changes in legislation in the several states.

Wholesale Prices—Practically no change in the general level of wholesale prices is shown in statistics just released by the Department of Labor, with 1926 as the basis of 100, the following is shown for paper:

	December 1927	November 1928	December 1928	Purchasing power of 1926 dollar in Dec.
Paper and pulp	90.9	88.8	88.6	112.9

Bankruptcy to be Analyzed—In an effort to lessen the number of commercial failures, the Department of Commerce will undertake a scientific analysis of the records of bankrupt firms to determine the fundamental causes of these business mortalities. The autopsy of defunct establishments will include manufacturing, wholesalers and retailers. Every business failure it is recognized as a disturbing economic influence and effects the chain of economic difficulties which

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STOCK solutions are pumped smoothly—without separating solids from liquids by the special 3-blade patented impeller.

This continuous flow at uniform pressure, so necessary for uninterrupted production, is not checked by sharp edges that prevent the free passage of stringy solids in solution and cause clogging.

This high shut-off pressure of this pump does away with the need of frequent cleaning. A 45° split casing makes occasional inspection an easy matter.

If you have any troublesome stock pumping problems, Fairbanks-Morse engineers will gladly make recommendations based upon your individual requirements.

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lead to business depression. Even the consumer has to pay for the loss in the shape of higher prices, etc. The fundamental weakness which leads up to bankruptcy will be studied with a view to providing a remedy. The results of this investigation will be published for the benefit of business as a whole, when concluded.

It is contended that bankruptcy not only disorganizes business but that the high mortality rate is a great economic waste which is entirely avoidable in large part. Diagnoses of particular cases of bankruptcy are planned, such as the different trades, paper, etc., with a view to determining sound corrective policies.

Industrial Equipment Study—As a result of the Department's investigation into industrial equipment begun some months ago, the information developed to date shows that it will be possible in the future to develop a more scientific replacement policy for machinery and to handle obsolescence questions in industry. The survey now being made covers (1) a census of machinery in use; (2) a study of the developments of machines of more or less standardized type among manufacturers; (3) working out a more adequate basis for cost of production accounting. The study will reveal, when completed, why each machine's predecessor was discarded, i. e., whether worn out, whether it involved too high production costs, or was inadequate for the purpose, and on the basis of these facts the department will work out tables of mortality and of risk. The idleness of machinery, as indicating the extent to which an industry is overbuilt, will also be shown.

Foreign Notes of Interest—Norway's paper industry was fully employed during 1928, with its output about the same as during the preceding year, but financial returns are reported unsatisfactory owing to low prices. Relatively good prices on the other hand, were obtained by the pulp manufacturers.

Minimum Wage Laws—"The Development of Minimum Wage Laws in the United States," 1912-1927, is the title of a report just issued by the Women's Bureau of the Department of Labor, tracing the growth of these laws in the United States, with a brief history of their development.

Treasury Issues Regulations—The Treasury Department has just promulgated its regulations 75, relating to the filling of consolidated tax returns of affiliated corporations prescribed under Section 141(b) of the Revenue Act of 1928. The new regulations are made applicable to the taxable year 1929 and subsequent taxable years.

Employment and Pay Rolls—Employment increased 0.5 per cent in December as compared with November and pay rolls increased 1.2 per cent, according to a report issued by the Bureau of Labor Statistics. With 1923 as the basis of 100, the following changes are shown:

	Employment			Pay-roll totals		
	1927	1928		1927	1928	
	Dec.	Nov.	Dec.	Dec.	Nov.	Dec.
Paper and printing	105.4	104.8	104.8	117.0	115.3	117.2
Paper and pulp	92.3	91.3	90.0	99.9	99.4	99.4
Paper boxes	100.6	102.5	98.8	113.3	121.8	115.8

Continued Deforestation—The grave consequences of continued deforestation make it imperative that the Federal Government, the States, and timberland owners join cooperatively in a more positive and aggressive effort to end the evils of forest devastation, says the Secretary of Agriculture in "Deforested America", just issued.

Northern Indiana Safety Conference

The first meeting of the Northern Indiana Industrial Safety Conference will be held at Fort Wayne, Indiana, February 15, 1929. This meeting is sponsored by the National Safety Council of Chicago, in co-operation with Fort Wayne Safety Council, Chamber of Commerce, and public utilities in adjacent communities.

Judging from the subjects on the program and the prominence of the speakers, this meeting will be a highly instructive and inspirational one. The interest already manifested indicates there will be a large attendance.

OHIO NEWS

Tom Harvey, manager of the Gardner & Harvey Paper Co., was prominently cited as a pioneer in the use of cost accounting in the paper industry when 200 manufacturers and accounting executives of Dayton and the Miami Valley met January 22. The meeting in Dayton was held under the auspices of the Dayton chapter of the National Association of Cost Accountants. L. P. Alford, editor of Management's Handbook and vice president of the American Engineering society, as the principal speaker of the meeting, giving as his subject "The Place of Cost Accounting in Management."

Max Strauss has been elected to the board of directors of the Black-Clawson company to fill the vacancy left by the death of his brother, Ben Strauss. Frank B. Cross Jr., of Cincinnati, will fill the place on the directorate occupied by the late Charles A. Hinsch, of Cincinnati. Other members of the board are A. C. Shinkle, of Cincinnati; Frank C. Trowbridge, Herman Kutter, and G. H. Helvey, of Hamilton; H. D. Martindale of Middletown and George Welliver, of Oxford.

In the direct line of progress which the Crystal Tissue Paper Company, has been enjoying the past few years, two new buildings are being erected adjoining the present mills of the company. One, a wareroom 85 by 100 feet, is an addition to the present wareroom and in the other, 50 by 100, is being installed a seven-inch engine unit. The latter building is a part of the new mill which was erected in 1912. Conservative additions to the building have been made since then as required.

Walter Hadley, assistant plant manager of the Gardner & Harvey Paper Company, Middletown for 18 years, has been appointed superintendent of the new mill in Lynchburg, Va., now being erected by the Mead Pulp & Paper Company, of Dayton. Before taking up his duties there he will make a tour of mills in the south.

The meeting of the Miami Valley Division of Superintendents which was scheduled for January 26 in Dayton, was postponed to February 9.

At a meeting of the board of directors of the George H. Mead Company, held in Dayton, Ohio early last month, George H. Mead, former president, was made chairman of the board. R. T. Houk, Jr., for eight years vice president and sales manager of the company, was promoted to the presidency.

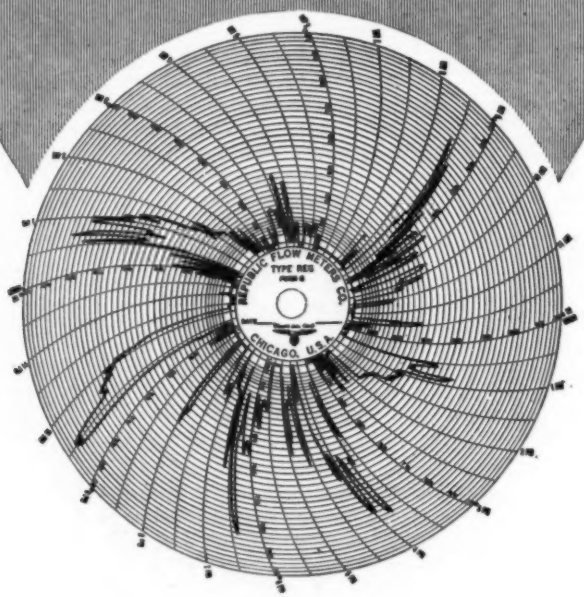
Omaha to Have Cornstalk Plant

A new company, known as the Omaha Cornstalks Products Company, has just been incorporated in Omaha, Nebr. This company has purchased the old Krug Brewery in Omaha and expects to equip this plant for the manufacture of wall board from cornstalks.

The plant will employ about 150 persons. It is expected that insulating material or wall board will be manufactured at first, but later, operations will be extended. The company also intends to open a number of similar plants throughout Nebraska. Albert Krug will head the company, and incorporators who are active in the organization of the company are P. G. Mittlebach, 313 S. 14th St., and G. W. Becker, 418 S. 38th Ave., Omaha.

The plans represent an investment of about $750,000 and it is expected to have the plant ready for operation about July 1.

The Chicago Mill and Lumber Co., Chicago, has plans for the erection of a plant at Greenville, Miss., where the waste from its sawmills will be converted into wallboard. This plant will have a capacity of 250,000 sq. ft. per day, and will be the third largest plant of its kind in the country.



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Large quantities of steam, available quickly will bring digesters up to the proper cooking temperature with the minimum loss of time.

Meet this requirement by means of the Ruths Steam Storage system which provides ample steam to meet peak demands and at the same time permits constant firing of the boilers to meet average steam demand.

This means increased production and lower fuel consumption. May we tell you about the many advantages of ample steam storage?

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Canadian News

New Milestone in Scientific Development

The official inauguration of the Canadian Pulp and Paper Research Institute, which took place on January 25, marks an epoch in the scientific development of the country. This institution, which is due to the farsightedness of the leaders of the Canadian pulp and paper industry, brings into close co-operation the Dominion government, the Canadian Pulp and Paper Association and McGill University for the purpose of applying pure or fundamental research as well as technical and engineering research to the solution of the major problems facing the industry. It is no exaggeration to say that, when the staff has been brought to its full strength, seldom, if ever, will such a wide variety of highly trained specialists have been gathered to work out together the solution of problems relating to a single industry. They will include chemical engineers, physical, colloid and organic chemists, botanists, bacteriologists and physicists.

It is a most striking example of co-operation; and co-operation was undoubtedly the keynote at the annual meeting of the Technical Section of the Canadian Pulp and Paper Association; it was greatly in evidence at the addresses of Prof. W. D. Bancroft, of Dr. W. K. Lewis and of Dean H. M. Mackay at the opening session; it was again brought forward, in a somewhat modified form, at the joint meeting of the Technical and Woodlands Sections; and it was stressed in the course of the brief addresses which marked the formal opening of the Institute when His Excellency, Viscount Willingdon, Governor-General of Canada, turned on the power which set in motion the Marcy rod mill.

More Merger Rumors

As is usually the case in January, when a large number of paper executives are assembled in Montreal for the annual meeting of the Association, rumors are being circulated of impending mergers in the industry. The most recent one brings together Abitibi and Canada Power and Paper, and could probably be traced to the joint acquisition by the two companies of the Thunder Bay Paper Co.

There is no doubt but that the present situation of the newsprint industry in this country is such as to make further consolidations highly probable, and it would be rather surprising if the year passed without some developments of this kind. It would not require any great amount of ingenuity to work out on paper a dozen different schemes, all of which would be very plausible; but there is such a complicated interlocking of interests that one guess is about as good as another, and no one but the parties involved could predict what may happen.

QUEBEC

New St. Lawrence Mill Nears Completion

Rapid progress has been made on the extension of the St. Lawrence Paper Mills Co., Ltd., at Three Rivers, and the two new paper machines are expected to be operating early this month. The Foundation Co. of Canada, general contractors for this addition, have now practically completed their work. Although the amount of work required exceeded the original estimate, and the first of the 1800 piles were only driven on May 18th last and several buildings were built on spread footings, the work has been done in record time. It must also be considered that work was hampered considerably due to several weeks of continuous heavy rains and the high water level of the St. Lawrence River.

The new extension has been constructed separate from the old mill, with which it is connected only by two galleries. The new mill has the following departments: train-shed and office building (the new office is much larger than the old one which will be abandoned and utilized for store purposes), a large roll-grinder room, finishing room, machine room for two 160-inch Dominion Engineering machines, a three-story power house where the steam turbines, low-pressure accumulator and most of the electrical equipment is installed, grinder room, mixing and screen room, bull screen and sliver room, and transformer house.

In addition to the above, there has been added to the existing buildings a new boiler house with two new 793-h.p., 425-pound steam boilers, furnished by Canadian Vickers, Ltd., and fired with a pulverized coal system installed by Combustion Engineering Corp. A complete new coal handling equipment with new coal trestle and coal hopper has been added. A new building for housing the steam switchboard has also been provided.

The sulphite mill has been gradually changed over to the Stebbins acid accumulator system in order to get a larger output from the existing digesters and an accumulator has been erected outside the digester house by the Dominion Bridge Co., this company having supplied all the structural steel for the contract.

The high tension transformer house was extended to take care of present and future requirements.

A new filter plant, 120 by 70 feet, with a capacity of 15,000 g.p.m. for the entire mill, is now in operation. The twenty pressure filters were furnished by Francis Hankin and Co., Ltd.

A. T. Hurter, resident engineer, was in charge of the extension.

Major Allan Laferrière, industrial commissioner of the City of Hull, received a letter a short time ago from the Mohawk Valley Paper Co., of Little Falls, N. Y., asking the price of power in 500, 1000 and 1500 horsepower lots. The officials of the company stated in their communication that one of their subsidiaries was studying the question of transferring their plant on account of the high cost of power at Little Falls.

John H. Metcalf, general purchasing agent for Howard Smith Paper Mills, Ltd., has also been appointed purchasing agent for Canada Paper Co., of Windsor Mills. He is located at 407 McGill St., Montreal.

Wm. Mackay, who for the past ten years has been general superintendent of the News Pulp and Paper Co., at St. Raymond, has severed his connection with that company. His position has been filled by Walter Corcoran, who has been with the company for several years.

Canadian Power and Paper Issues New Stock

A new issue of $2,500,000 Canadian Power and Paper Investments, Ltd., 5 per cent cumulative convertible preferred stock has been offered by Nesbitt Thomson & Co. The stock, which is of $50 par value, is preferred as to dividends and assets and ranks for dividend as from February 1st. It is redeemable as a whole or in part at any time after January 1, 1934, at the option of the company, on sixty days' notice at 105 per cent of par value; will be convertible at any time at the option of the holder, share for share, into the no-par-value common stock of the company, or in the event of redemption, up to 10 days before the date of redemption specified in the redemption notice.

The company was incorporated in 1920 under the laws of the Dominion of Canada, and was organized primarily to invest in selected securities of hydro-electric, public utility and pulp and paper companies, without necessarily aiming

The number of individual mills that operate Ross equipment would greatly exceed the above impressive number of pulp and paper companies. Such a record clearly reflects the confidence of the pulp and paper industry in the ability of Ross designed systems to produce desired results, efficiently and economically.

Ross-Briner Economizer; Ross-Grewin High Pressure Machine Ventilating System; Ross-Baxter Grinder Exhaust System; Ross Systems for Machine Rooms, Beater and Storage Rooms, Calender Cooling, Trim Conveying, Unit Heaters. Consult Ross Engineers Regarding Your Requirements.

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Main Office—30 E. 42nd Street, NEW YORK
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ROSS ENGINEERING OF CANADA, LIMITED

NEW BIRKS BLDG., MONTREAL

ROSS SYSTEMS
HEATING—VENTILATING—DRYING

to acquire controlling interests. The powers conferred by its charter and by-laws have been designed to allow the management as great a degree of freedom of operation as is consistent with conservative financial practice.

Seven hundred and fifty guests were invited by the directors of the Anglo-Canadian Pulp and Paper Co. to attend a dinner celebrating the first year of activity of the mill. During the course of the event it was stated that the daily average production amounted to 485 tons of paper, while a maximum of 512 tons had been turned out. The mill was started up on December 1, 1927, and employs some 700 people.

It is understood that the Wayagamack Pulp and Paper Co. hopes to be ready by the early spring to manufacture pure sulphite papers for the waxing trade. As a considerable amount of such papers are at present being imported from the United States, it is hoped to fill a larger proportion of the local demand with domestic products.

Hull is one of six Canadian municipalities that are being considered as the location for the new large fiber plant to be erected in Canada by the Keyes Fibre Co., New York. It is understood that the company first considered thirty different Canadian sites, of which twenty-four have been eliminated, leaving Hull still very much in the running. Another of the remaining sites to be considered is understood to be in the vicinity of Gatineau, where Canadian International Paper and its subsidiary, International Fibre Board, are located.

Dr. J. L. A. Macdonald, technical director of the famous Tullis Russell Paper Mills, at Markinch, Scotland, was recently visiting a number of Canadian pulp and paper mills. A very pleasant luncheon in his honor was given by G. L. M. Hellstrom, of Paper Machinery, Ltd., who has been a close friend of Dr. Macdonald for many years, and was formerly very active in pulp and paper research work in London. Dr. Macdonald's outstanding work in practical chemical technology after the war has been no less effective than the development of scientific control and the application of research to modern methods of paper mill operation.

About a month ago a fire broke out in the mill of the Back River Power Co., roofing felt manufacturers, assumed such proportions as to require assistance from the central stations of the Montreal Fire Department, and caused an estimated damage of over $6,000. The fire is thought to have originated in a back room where paper and rags may have been ignited by friction from the nearby machinery.

ONTARIO

Dryden Reorganization

At a special meeting of the shareholders of Dryden Paper Co., held in Montreal last month, the increase in capital recommended by the board of directors was authorized. President J. H. A. Acer announced that an offering of 40,000 shares would be made to shareholders on the basis of two shares for every five held, at $25 a share. An additional 10,000 shares were being accepted by the debenture holders in place of arrears of interest. There will also be offered $1,500,000 of 6 per cent bonds. The proceeds of the two issues will be sufficient to retire the notes and debentures at present outstanding, as well as bank loans amounting to $550,109, and leave $200,000 cash on hand.

On the completion of the new financing, the company will be in a strong liquid position. The fixed charges will amount to only $90,000 annually, as compared with net earnings available for interest for the fiscal year ended September 30, 1928, of $325,706.57, which is equal to over three and one-half times requirements.

The following were elected directors: J. H. A. Acer, Geo. Chahoon, Jr., S. A. Sabbaton, P. A. Thomson, E. Parkins, J. B. Woodyatt, F. Perry and Dan McLaughlin.

I. P. Co. Exercises Nipigon Option

A report which, though not confirmed, seems to be well founded is current that the option which International Paper has had on a block of property close to Nipigon has been taken up and that the new paper mill will be built there. With the existing groundwood mill at Nipigon as the nucleus of the plant, the company was inclined to favor that as the site for the new mill, although there were a few drawbacks, such as greater difficulty in securing solid foundation for piling than would have been found in Fort William, and the disadvantage of being more remote from the labor supply than would be the case at either Fort William or Port Arthur. The advantages at Nipigon, however, have outweighed these drawbacks and the mill will be built close to the source of pulpwood.

The newly-acquired site adjoins the existing groundwood mill and is about two miles distant from the present town of Nipigon. It is expected that, with the advent of the new plant, another town site will be established closer to the mill than the present town site.

The Chamber of Commerce, Midland, recently sent a communication to the International Fibre Board Co., Gatineau, Que., making inquiry as to when the plant would be reopened at Midland. President H. J. Wiser stated that the commencement of operations of the company's Gatineau mill greatly increased the productive capacity, and naturally the market could not absorb this right away. He stated, however, that encouraging strides towards the absorption of this extra output had been made and he had great hopes of resuming activities at the Midland plant in the very near future.

Dr. Robert Boyd, late contracting physician for the Fort William Paper Co., the Great Lakes Paper Co., and many other operations connected with the woods in Northern Ontario, died recently in the McKellar Hospital, Fort William. He was the first physician at the head of the Great Lakes to inaugurate the medical inspection of employees prior to their employment. The system has been in operation for the past two years among the employees of the Backus-Brooks Co.

D. Kemp Edwards, Ltd., Ottawa, has acquired the retail lumber interests of Canadian International Paper at Ottawa. The purchase includes stock located on the Canadian International Paper property on Sussex St., Ottawa, and the company's property at Eastview. William Schryer, former manager of the Canadian International Paper plant at Eastview has been appointed manager of the new operations.

S. F. Duncan Heads Provincial Paper

S. F. Duncan, formerly treasurer of Provincial Paper, Ltd., has been elected president and general manager, succeeding the late I. H. Weldon as chief executive. T. A. Weldon continues as vice-president and Walter Barber, until recently secretary of the company, now fills the dual position of secretary-treasurer.

Mr. Duncan, who is a native of the State of Michigan, was twelve and a half years with the Bryant Paper Co., at Kalamazoo, Mich. In 1909 he and Mr. Weldon came to Canada and organized the St. Lawrence Paper Co., and purchased the pulp and paper mill at Mille Roches. Several re-organizations and changes took place, the plant was enlarged, other plants were acquired, and the company, now known as Provincial Paper, Ltd., has grown to its present size and importance. In addition to the original mill at Mille Roches, the company owns and operates mills at Thorold, Georgetown and Port Arthur.

The Canadian Paper Box Manufacturers' Association, feeling that the industry in Canada had reached a stage where its various outlying branches, as well as those in the larger centers, would be better served by the employment of a secretary who would devote all his time to educational, organization and cost work in the interests of the members,

RYTHER AND PRINGLE COMPANY
CARTHAGE N.Y.

RYTHER SHREDDER

DISCHARGING SHREDDED STOCK DIRECTLY INTO BEATER TUB ELIMINATING CONVEYING SYSTEM.

SAVES FURNISH TIME
SAVES BEATING TIME
SAVES POWER

The shredder installation described reduces the return board broke from two machines and also prepares a liner furnish, consisting of groundwood books and papers. The shredder is mounted on an elevated platform and driven by a thirty horse power motor. This setup is able to make a two thousand pound furnish in twenty minutes. Excessive peak loads on the beater drive are eliminated because the stock is delivered into the beater tub in uniformly fine pieces which readily absorb water and are quickly repulped.

Please ask for Bulletin 627

CANADIAN INGERSOLL-RAND COMPANY, LIMITED
10 PHILLIPS SQUARE, MONTREAL, P. Q.

decided to employ a full-time secretary. Consequent on this decision, S. J. Frame, who for the past fourteen years has been secretary of the association and of the Toronto Carton Council, resigned his position. The association has secured the services of C. B. Hodder, formerly with the Dominion Government Taxation department, who opened an office in the Commerce and Transportation Building, Toronto, on January 1st.

Foundations are completed for office, factory and warehouse units, and are now going in for the boiler room in the construction of the new plant at Leaside, Toronto, of the Corrugated Paper Box Co., Ltd. Plans call for a paper box plant comprising small office unit, single factory unit 200 by 700 feet, with adjoining warehouse 150 by 200 feet, and also a boiler room 50 by 60 feet, to be concrete, steel, brick and metal clad construction.

Abitibi News

T. E. Silver has been appointed mill manager of the Iroquois Falls Division of the company. He joined the company in 1915 as machine tender. By reason of his ability and earnest application to work, in 1922 he was made boss machine tender; in 1923, paper mill superintendent; in 1926 he succeeded J. E. Patterson as general superintendent, and has now again succeeded him as mill manager at Iroquois Falls.

F. L. Mitchell has been appointed assistant to J. E. Patterson, with the title of assistant manager of operations. On graduating from McGill University, Mr. Mitchell started work at Iroquois Falls as a tester in the Service Department and steady application to duty earned him several promotions. In 1923 he was placed in charge of the physical control end of the Service Department. At the end of that year he was appointed assistant sulphite superintendent and a few months later sulphite superintendent. In 1927 he was given charge of the operation of the Smooth Rock Falls Division (Mattagami Pulp and Paper Co.) which had been acquired a short time previously.

J. S. Brown has been made assistant sulphite superintendent of the Iroquois Falls Division. He first joined the company in 1917 and has climbed the ladder steadily, being made sulphite repair foreman in 1922.

Night classes in elementary mathematics and English have been started at Smooth Rock Falls. Other subjects, including mechanical drawing, are to be added to the curriculum. Employees of the company attending 75 per cent of the classes, not counting absence due to shift work, will be reimbursed the $3 registration fee.

Owing to failure to arrive at a satisfactory solution of the present tangle in the Canadian newsprint industry, the Espanola Division was shut down completely on January 12th. As this is the only industry of the town, in order to afford some relief the Provincial Government immediately started work on the roads in that district. Operations were resumed, however, by starting up one machine on the 21st of the same month; and at the same time an additional machine was started up at the Sault Ste. Marie Division. No information is available as to when further work will be started at Espanola, but hopes are expressed that operations will be extended before long.

The Thunder Bay Paper Co.'s mill at Port Arthur, which was recently acquired from the American owners by the Abitibi company and the Canada Power and Paper Co., is now running at capacity.

Pursuant to a judgment given on December 19th last, the assets of the Superior Paper Mills, Ltd., at Thorold, will be judicially sold by tender on February 7th.

M. H. Parker, of Toronto, a former president of the International Brotherhood of Paper Makers, and a man who was known to practically every local of the union in the United States and Canada, through his long and prominent association with the paper makers' union, died from pneumonia in Toronto last month, after a short illness. He had moved to Toronto only a few months ago, and at the time of his death was employed in the plant of the United Paper Board Co.

The paper warehouse of R. Florence, Ottawa, was recently the scene of a stubborn fire, the cause of which is attributed to spontaneous combustion in a waste material chute. Little damage was done to the seven-story warehouse which is of fireproof construction. The flames, after spreading to different parts of the large warehouse, were confined to bales of paper.

Paper Sales, Ltd., Toronto, have been appointed selling agents for the Detroit Sulphite Pulp and Paper Co., for Ontario and Eastern Canada. The Detroit company manufactures complete lines of bristols, covers, tissues, waxing papers, specialties, etc., made of Mitscherlich sulphite.

Fire of unknown origin broke out in the building of the Buntin Reid Paper Co., Toronto, on January 12. The fire was first discovered in the basement, and before it could be brought under control the building and stock were damaged to the extent of $75,000. The loss was fully covered by insurance.

According to Hon. Wm. Finlayson, Minister of Lands and Forests, detection and suppression of forest fires in Ontario during 1928 cost the Government approximately $1,300,000. Territory destroyed by fire approximated 100,000 acres, most of which was in the far northwest corner of Patricia, out of reach of both ground and aerial fire-fighting forces. The service's record is viewed as a most remarkable one, in view of the fact that it had to face probably the most serious spring fire hazard in its history.

The Lincoln Division of Alliance Paper Mills, after prolonged experimental work, has attained a considerable measure of success in the manufacture of waxing papers. Contracts were let some time back for the reconstruction of the paper machine in the Lybster mill to correspond with the most modern practice in the economical and efficient production of this grade of paper, both for sealing and dry wax uses. This work is now rapidly approaching completion, and it is anticipated that in a very short time the machine will be in operation on the new basis. While it is understood that there will not be sufficient waxing paper orders available to run the machine to capacity, it will also manufacture others of Alliance Paper Mills' standard grades.

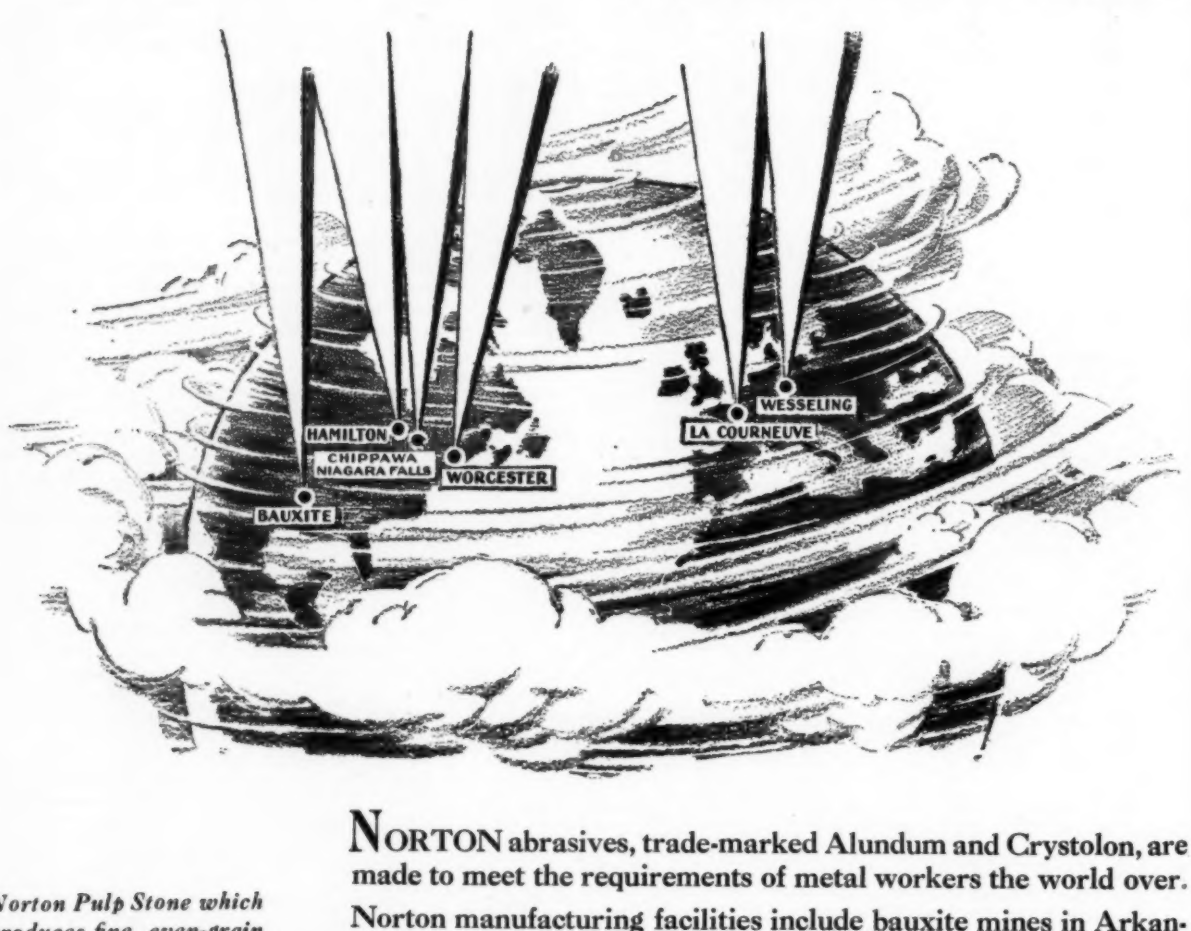
NEW BRUNSWICK

At a special shareholders' meeting held recently in Montreal, the authorized capital stock of Fraser Companies was increased to 500,000 shares. Part of this increase is being offered to the shareholders, while some 92,000 shares are being kept in the treasury.

BRITISH COLUMBIA

Airplanes will be used to explore the province's timber wealth this summer, according to plans now being drafted by the Provincial Government, in co-operation with the Federal Government. According to Hon. F. P. Burden, Minister of Lands, the intention is to explore some of the less known forest areas of the province. In some parts of the province there has been practically no survey whatever, and Mr. Burden believes that the pending investigation will disclose the existence of large stands of merchantable timber hitherto unknown. The Federal Government has done some aerial survey work in the province in the past, but not on an extensive scale. Next summer's campaign will represent the first thorough attempt to plot British Columbia's forests from the sky.

For All the World—
Norton Abrasives



Norton Pulp Stone which produces fine, even-grain pulp uniformly and continuously, is a development in answer to a definite requirement of the wood pulp industry.

NORTON abrasives, trade-marked Alundum and Crystolon, are made to meet the requirements of metal workers the world over.

Norton manufacturing facilities include bauxite mines in Arkansas, electric furnaces at Niagara Falls, N. Y. and Chippawa, Canada, grinding wheel making plants in Worcester, Mass., Hamilton, Ontario, La Courneuve, France and Wesseling, Germany.

Norton grinding machines, floors, refractories and porous plates are produced in the home plant in Worcester.

NORTON COMPANY
WORCESTER, MASS.

Canadian Trade Now Supplied from Canadian Plant

Grinding Wheels
Grinding Machines

NORTON
PULP STONES

Refractories - Floor
and Stair Tiles

BRITISH CORRESPONDENCE

Monthly Report on Trade Conditions

In the esparto section, it is difficult to keep cost figures within reasonable bounds at present, for the diversion of native labor in the esparto crop territory has resulted in a shortage of raw material to such an extent that certain mills in Scotland have been reduced to borrowing supplies. Much tonnage of grass will now be lost to the industry, and the result has been the stiffening of market prices, and as much as five dollars a ton extra is being asked for the available grass.

Price conditions are also unstable in the newsprint section. The margin of loss and profit on newsprint manufacture in this country is largely a measure of mill organization and equipment. The competition of Scandinavian and Canadian newsprint mills leaves those makers whose output is not scientifically organized and controlled no chance to avoid losing trade or profit.

Much the same position applies to the wrapping section, although the manufacturers have the advantage of the safeguarding tariff to support their efforts, and it is interesting to note that there was greater activity in plant improvement extension and new development in the wrapping section last year than in any previous period.

Probably, however, no section of the paper industry has benefited more from standardization and specialization than the newsprint section. Gradually big changes have been made in the method of manufacture, which have enabled increased demands to be met and prices to be reduced. Few British newspapers to-day are printed without a good number of illustrations. This has necessitated a different type of paper, and gradually a sheet with a good, hard, and smooth printing surface has been evolved which while being suitable for halftones is sufficiently soft-sized to print at top speed without offset. Such paper has become the generally accepted standard for newsprint mills, and differs only in color. A standard weight of substance 23-24 lb. double crown has also been generally adopted, and the widths of reels are nearer to standard than they have ever been.

Newsprint mills are now almost entirely distinct and separate from other paper mills. Many of them belong to one or the other of the big newspaper combines, while in the remainder the newspaper concerns hold the controlling interests, and thus have first claim upon output.

Apropos the esparto shortage, some interesting comments on esparto production appear in a recent issue of The Newspaper World. "Before the war," it states, " a certain Scottish mill made excellent esparto writings and printings, also imitation arts and white pulp boards. During the last year or two they have dropped the making of writings and have concentrated upon the other three, more especially upon the imitation arts and white pulp boards. In this way, they have so perfected the manufacture of the last two lines that their goods are now known throughout the trade for their excellence and regularity of making. For very many years the Scottish mills have specialized in the making of fine papers from esparto grass. Why this should be, few seem able to explain, but the fact remains, and anyone who wants something good and reliable in this way naturally turns to the Scottish mills to satisfy his requirements. Esparto is the best raw material—one might almost say the only satisfactory raw material—for making imitation arts and for the body paper of the best coated arts, so that it is not surprising to find that nearly all of the best papers in these two lines come from across the border."

An expert in the trade makes a rather depressing summing up of paper trade progress in 1928. He says: "The twelve months may be briefly summed up in a sentence: Increased capacity for output in every branch of the trade; over-production at home and abroad; stagnant or lowered consumption owing to general trade depression in some of the principal industries of the land, with the resulting keen competition and price-cutting and the feeling of depression arising therefrom. On the other hand, it may be said that there is a spirit of really cheery optimism in the trade and a general impression that the worst has been and that in the year just started business all round will steadily improve and become altogether more satisfactory.

There has been little, if any, increase in demand during the past twelve months for the better printing papers and moderately priced writings. Arguments are being put forward in certain directions for an extension of the safeguarding measures to all kinds of paper in addition to wrappings to which it is at present confined. Some makers contend that if only a portion of the foreign paper had been kept out of the country enough paper has been used up in this country to have kept all British mills more than fully employed. Two at least of the Parliamentary parties seem in favor of protective measures.

Pure wood papers are down to the lowest prices they have been since the war period, although there is a tendency on the part of the pure sulphite pulps to harden in price. Esparto mills are competing with the wood pulp mills at a much lower price than normal even although there is a shortage in supplies of esparto grass that is likely to continue.

Since 1919 the productive capacity of British mills has been increased to the extent of nearly 5,000 tons per week. For a long period the consumption of paper in this country has been about fifty per cent greater than the total capacity of the mills, and the deficiency has been met by imports from Continental, Newfoundland, and Canadian mills. Now the over-production tonnage from other countries is being landed in this country and is competing with the paper from British mills, with a result that they are placed in the unhappy position of not being able to get sufficient orders to consume their present possible output.

The following table sets out in summary form the exports in paper-making, printing and bookbinding machinery in the last two years, in tonnage and in value:

Eleven Months ending Nov. 30th.	Quantities (tons) 1927	1928	Value (£) 1927	1928
Paper Making Machines	5,266	3,925	405,983	401,493
Printing, Bookbinding, etc. machines	4,233	5,290	969,548	1,114,152

Imports and Exports

Below are set out the values of paper trade imports and exports in December, together with the increase or decreases as compared with the corresponding month of the two preceding years:

IMPORTS

	Dec., 1928.	Inc. (+) or Dec. (—) as compared with 1927.	as compared with 1926.
Paper-making M'terials	10,151,792	—2,637,071	—1,790,875
Paper and Cardboard..	17,269,991	+ 840,045	+1,552,292

Quantities of the same articles imported:

	Dec., 1926	Dec., 1927	Dec., 1928
Wood pulp, tons	139,100	145,066	118,237
Paper, cwt.	1.368,219	1,534,834	1,826,360

EXPORTS

	Dec., 1928.	Inc. (+) or Dec. (—) as compared with 1927.	as compared with 1926.
Paper-making Materials...	115,850	+12,840	+26,099
Paper and Cardboard.....	790,438	+41,417	+74,505

Quantities of the same materials exported:

	1926.	1927.	1928.
Paper-making mater'ls, tons	10,793	14,625	15,858
Paper & cardboard, cwt.	299,281	332,772	364,483

An appeal for £3,150,000 share capital has been made by Anglo-Foreign Newspapers Ltd., a company formed on January 10th, this year, to acquire, found, and develop newspapers and allied undertakings at home and abroad. It is pointed out in the prospectus that the progress of foreign newspapers has been slow in comparison with the expansion which has been seen in recent years in this country and America, but definite signs were now apparent that on the Continent widespread attention was being directed to the importance of the press. An agreement was made between the company, the Carmelite Trust, Ltd., and the Associated Anglo-Atlantic

REED-SPAFFORD PULP SCREEN

(Built in two sizes)

The REED-SPAFFORD PULP SCREEN is remarkably efficient. Its capacity is large and its power consumption is surprisingly low. Let us show you what a saving this screen means to you.

Our Paper and Pulp Machinery is CONSTANTLY IMPROVED

Improved Paper Machinery Co.

Nashua, N. H., U. S. A.

SHERBROOKE MACHINERY CO., Limited

Sherbrooke, Quebec, Canada

Corporation, Ltd., for the latter two bodies to supply equal proportions of shares.

At the ordinary general meeting of Bowater's Paper Mills, Ltd., Eric V. Bowater, chairman, pointed out that competition had been and continued to be keen particularly from overseas, there being an over-production in some manufacturing countries, but thanks to the modern layout and equipment of their mills, the company had been able so far to meet their competition, and the entire production for the existing plant for the coming year had been sold. The mills were to be enlarged and the existing plant doubled, and upon completion of these extensions the company would possess one of the most modern newsprint mills in Europe, capable of producing more than 100,000 tons of newsprint per annum. The consumption of newsprint continued steadily to grow, additional newspapers were making their appearance, and existing ones increasing not only in circulation but in the number of pages printed, and the directors of the company had confidence in the ability of their sales agents to dispose of the additional output.

NEW YORK CITY NEWS

Armstrong Co. Buys Arrowhead Mills

An important transaction announced here a few days ago involved the purchase of the Arrowhead Mills, Inc., roofing felt manufacturers in Fulton, N. Y., by the Armstrong Cork Company, large producers of linoleums, rugs, carpets, and other floor coverings, with headquarters in Pittsburgh, Pa., and mills in Lancaster, Pa., and branch and sales offices in New York City.

While details of the purchase are as yet lacking, it can be stated that the Armstrong Company will take over the felt mill of the Arrowhead Mills and will continue to operate it for the production of rag base felts for the manufacture of rugs and other flooring. The Armstrong Company produces a complete line of felt base rugs and other flooring, and heretofore has purchased its base felt from the Arrowhead Mills and other manufacturers. Now it will produce its own felt, and it is probable that it will develop additional lines of felt base flooring products.

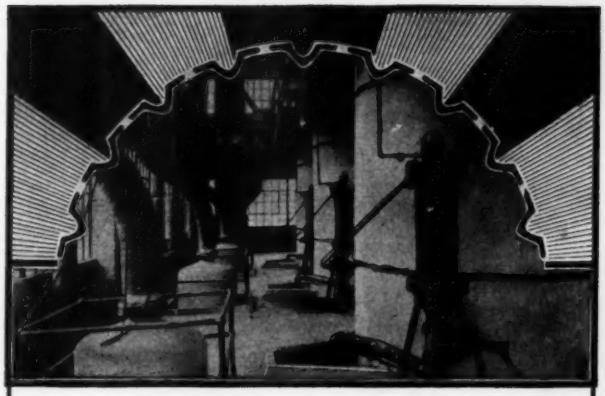
Charlton Manager of Mfg. Dept.

E. A. Charlton has been appointed manager of the Manufacturing Department of the International Paper Company, and will have charge of the operation of the northern United States and Canadian paper mills of the company, according to an announcement issued from the company's headquarters in New York City.

Mr. Charlton was born in Montreal and was graduated from McGill University. He was associated with the paper mill properties of The New York World when they were acquired two years ago by the International Paper Company. Mr. Charlton is vice president and general manager of the International Power and Paper Company, of Newfoundland, Ltd., a subsidiary of the International Paper Company, which owns and operates the Corner Brook, Newfoundland, newsprint paper mill and allied properties.

The Continental Paper and Bag Corporation, a subsidiary of the International Paper Company, announces the appointment of J. H. Wantling as its Philadelphia representative. Mr. Wantling heretofore has been the Continental's special representative on tissue paper products for the entire United States. The Continental makes a complete line of wrapping and tissue papers, and is one of the largest manufacturers of paper bags in the world.

The old paper stock house of Darmstadt, Scott & Courtney, Inc., one of the longest established and best known concerns in the country dealing in raw materials for paper mills, has moved its offices from 178 South street to larger and more centrally-located quarters at 150 Nassau street, New York, where Rooms 1602 to 1609 are occupied. The new offices pro-



MORTERUD SYSTEM
in the
Union Bag and Paper Mills

DURABLE, dependable, economical—the Morterud System of indirect heating with positive circulation reduces waste and increases efficiency.

Steam is not put directly into the digester, but circulates through a series of seamless steel pipes. Therefore *no dilution*—black liquor actually increases in density and capacity of the recovery plant is stepped up. Pressure is brought up rapidly, followed closely by temperature: Liquor is forced through the heater and spread uniformly through the digester every ten or fifteen minutes. *Uniformity.* No over-cooking—no undercooking.

This produces bigger yield from the wood—a stronger, better quality pulp—and reduces quantity of chemicals used. As cooking time is reduced, the capacity is increased. Undiluted, the steam condensate is pumped directly back to the boilers—another big economy.

Savings effected by the use of this system pay for the installation in an astonishingly short time. Its advantages are so great that the initial cost is hardly a consideration.

Slab Barking With U-BAR Drums in the Union Bag and Paper Company

Slab barking in the Union Bag and Paper Company with U-BAR Drums is a very real success. And no matter how strict the requirements are for CLEAN pulp, the U-BAR Slab Barking method meets them.

Built to fit the job—Big Production results from the special design and its continuation is insured by rugged dependable construction. The specially designed U-BARS of high carbon steel are securely *riveted* to heavy ship channel rings—thus effective, clean barking.

Smooth rotation is the result of chain suspension with guide rolls, sprockets and spring takeups or shock absorbers—hence *faster* rotation and BIG PRODUCTION.

The Giant Nekoosa Bark Press

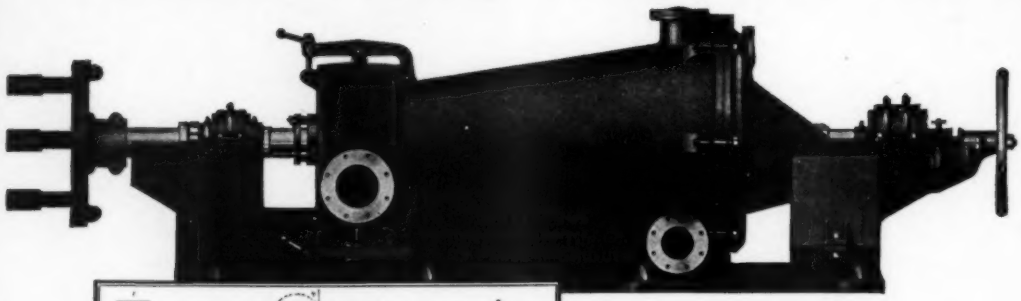
Handles refuse bark from the U-BAR Drums. Reduces water in bark to 55%—almost natural water content. Turns bark disposal problem into a steam generating asset. Strong, rugged construction. Simple operation. A machine of far-reaching economy, as all users enthusiastically testify.

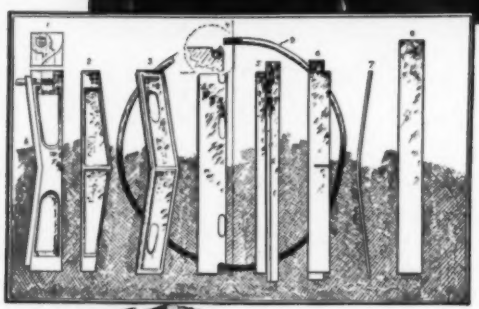
Full Details Sent on Request

Fibre Making Processes, Inc.
CHICAGO, U. S. A.

Canadian Barking Drum Co., Ltd., Toronto

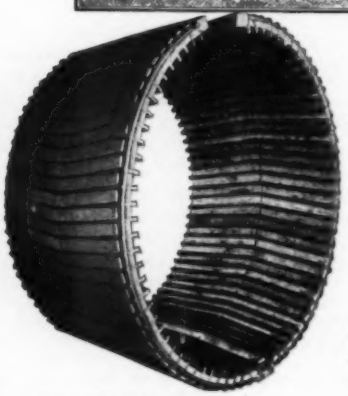
BARKING **U-BAR** DRUMS





As Mighty as HERCULES

As Enduring As Modern Engineering Can Build It



And Now Its A Question Of Economy Production—

To-day paper mills are seeking ways and means to maintain their present output on a basis of scientific economy.

The Hercules Jordan Cuts Costs From Every Angle—

Its Timken Tapered Roller Bearings give assurance of an accurately centered plug under all loads. A fifth to a third more service from plug and shell fillings with a saving of practically one half in labor when a change is required. H. P. saving as high as thirty per cent, and a maintainance saving of twenty-five to thirty-five per cent over babbitt bearing Jordans.

Copyright 1928

Assembly Of Shell Filling Is Exclusive and Important

The center illustration suggests how the several parts of the shell filling are united into a single unit—(one solid mass.) Observe how the tension bar passes over the ends of the oak separators and through slots in the knives, and finally locking in the female triangle number one. A bulletin outlining this construction in detail is available upon request.

Atlantic States
GIBBS-BROWER CO. INC.
261 Broadway, N. Y.

Canada
WATROUS LTD.
Brantford, Ontario

Pacific States
A. H. COX & CO. INC.
Seattle, Washington

THE HERMANN MANUFACTURING CO.

Lancaster, Ohio

vide private rooms for Louis F. Darmstadt, the head of the firm; Louis Marcovitz and Walter T. Clark, as well as an attractive and spacious reception room. Darmstadt, Scott & Courtney, Inc., was founded in 1855 by the father of Louis F. Darmstadt, and thus has been in existence 74 years. Louis F. Darmstadt is this year celebrating his fifth anniversary in the paper stock trade.

Charles,F. Hubbs & Company, of New York City, have been appointed distributors of Gator Hide Mulch paper in New York and surrounding territory, including Long Island, by the International Paper Company, manufacturer of the new paper. The Hubbs & Howe Company, of Buffalo, N. Y., and the Interstate Cordage and Paper Company, of Pittsburgh, also have been appointed distributors of Mulch paper in their respective territories.

The Groveton Paper Company, of Groveton, N. H., which has just started to handle its lines direct, has opened New York City sales offices in the Salmon Tower Building, 11 West Forty-second street.

Henry Condict Munger, member of the firm of Moore & Munger, importers of papermakers' clay of 33 Rector street, New York, and widely known among paper manufacturers, died at his home, 1441 Prospect avenue in Plainfield, N. J., on January 5 following a week's illness of pneumonia. Mr. Munger was 64 years of age. He was a member of the Board of Governors of Muhlenberg Hospital in Plainfield, the Crescent Avenue Presbyterian Church and the Plainfield Country Club. He was interested in Plainfield charities and contributed largely to their support. He leaves a father, and a sister.

Mrs. Maxwell Howard, of Dayton, O., wife of Col. Maxwell Howard, widely known paper manufacturer of writing paper with mills in Dayton, Urbana and Franklin, O., died at the Savoy Plaza Hotel in New York City on January 3. Mrs. Howard was the only daughter of H. H. Hoffman, capitalist of Cincinnati, O., and frequently visited in New York, where her only daughter, Countess Perdicaris, lives at 570 Park avenue. Her only son, Howell H. Howard, lives in Dayton. The body was taken to Cincinnati for burial.

Floyd G. Simmons, secretary of the International Paper Company, of New York, died on January 3 in the Mount Vernon Hospital, Mount Vernon, N. Y. He had been ill nearly a year following an attack of pneumonia, and was 50 years old. Born at Bernie, N. Y., and educated in the public schools of Albany, N. Y., Mr. Simmons came to New York City while a young man and in 1901 became connected with the International Paper Company, becoming its secretary 15 years ago. He was also secretary and director of the Atlantic Coast Steamship Company and the Champlain Realty Company. His home was at 451 High Brook avenue, Pelham Manor, N. Y.

Announcement was made a few days ago by the Robert Gair Company, manufacturer of paper board and paper boxes and containers whose main offices are in New York City, with factories in several places through the East, that it has acquired and will merge the Warner & Childs Company, Inc., of Medford, Mass., one of the oldest leaders in the manufacture of corrugated board products in New England, thereby completing a chain of box plants located for the economical distribution of containers in the East. R. M. Taylor, president of the Warner & Childs Company, Inc., will continue in its management and assume more extended activities in the Gair organization. The personnel of the Warner & Childs Company, Inc., will be kept intact.

Percy J. Michelbacher and Sol Katzenstein have been appointed equity receivers, under $25,000 bond, by Judge Coleman for the Independent Paper Mills, Inc., of 475 Fifth avenue, New York, which operates paper mills at Plattsburg, N. Y. The receivers were appointed on the petition of Milton Fleischer, of Baltimore, Md., a creditor for $32,900, and upon the consent of the debtor corporation. The liabilities are

Cleans wires to the metal —then stops

WIRES on Fourdrinier and cylinder machines are thoroughly cleaned with absolute safety the Oakite way. For, while Oakite materials get right down to the metal, they cannot eat into the mesh or roughen the surface. Applying a hot solution of an Oakite material simply loosens every particle of dirt, pulp and foreign matter so that they are readily removed.

And safe, thorough Oakite cleaning saves money. Wires last longer and require less frequent renewal. Their surfaces stay smooth and do not quickly accumulate dirt. Cleaning is needed less often—production increased. The job is done rapidly and with little effort.

Practical time and work-saving suggestions for this and many other cleaning operations are outlined in our new booklet "Oakite in Paper Mills". Write for your copy. No obligation.

Manufactured only by
OAKITE PRODUCTS, INC., 16A Thames St., NEW YORK, N. Y.

Oakite Service Men, cleaning specialists, are located at

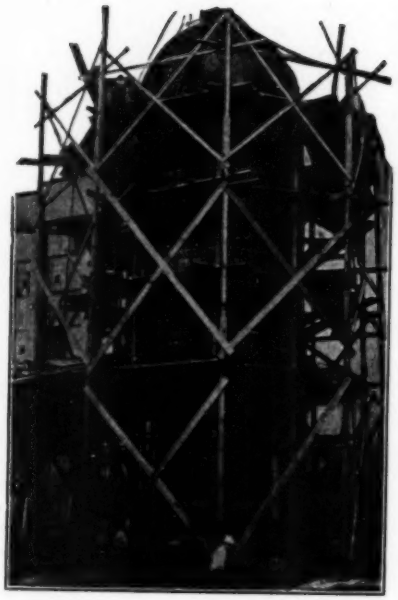
Albany, N. Y., Allentown, Pa., Altoona, Pa., *Atlanta, Baltimore, Birmingham, Ala., *Boston, Bridgeport, *Brooklyn, N. Y., Buffalo, *Camden, N. J., Canton, O., Charlotte, N. C., Chattanooga, Tenn., *Chicago, *Cincinnati, *Cleveland, *Columbus, O., *Dallas, *Davenport, *Dayton, O., Decatur, Ill., *Denver, Des Moines, *Detroit, Erie, Pa., Fall River, Mass., Flint, Mich., Fresno, Cal., *Grand Rapids, Mich., Harrisburg, Pa., Hartford, *Houston, Tex., *Indianapolis, *Jacksonville, Fla., *Kansas City, Mo., *Los Angeles, Louisville, Ky., Madison, Wis., Memphis, Tenn., *Milwaukee, *Minneapolis, *Moline, Ill., *Montreal, Newark, N. J., Newburgh, N. Y., New Haven, *New York, *Oakland, Cal. *Omaha, Neb., Oshkosh, Wis., *Philadelphia, Phoenix, Ariz., *Pittsburgh, Pleasantville, N. Y., Portland, Me., *Portland, Ore., Poughkeepsie, N. Y., Providence, Richmond, Va., Reading, Pa., *Rochester, N. Y., Rockford, Ill., *Rock Island, Sacramento, Cal., *San Francisco, *Seattle, *St. Louis, *St. Paul, South Bend, Ind., Springfield, Mass., Syracuse, N. Y., *Toledo, *Toronto, Trenton, *Tulsa, Okla., Utica, N. Y., *Vancouver, B. C., Waterbury, Conn., Wichita, Kan., Williamsport, Pa., Worcester, Mass.

*Stocks of Oakite materials are carried in these cities.

OAKITE
TRADE MARK REG U.S. PAT. OFF.
Industrial Cleaning Materials and Methods

~and Manitowoc Digesters

Quotations on equipment for increased sulphite mill capacity or a new mill are not complete until Manitowoc Digesters are included.



Now in 81 Mills

Manitowoc Digesters are serving 81 out of a total of 136 sulphite mills in the United States and Canada, the first installation being made in 1891. It pays to consider the experience of workmanship necessary for the fabrication and erection of good Digesters. We will be glad to furnish quotations and information on request.

Other MANITOWOC Equipment

EXPERIMENTAL DIGESTERS
GLOBE ROTARIES
CYLINDRICAL ROTARIES
PAULSON BARKING DRUMS
RELIEF SEPARATORS
ROSIN MELTERS
JACKETED KETTLES
INCINERATORS
DISC EVAPORATORS
BLOW PIPES
DIFFUSERS
CAUSTICIZING EQUIPMENT
ROTARY LIME KILNS
BLEACH & CLAY MIXERS
MOORE SPEEDCRANES AND SHOVELS

MANITOWOC ENGINEERING WORKS
Manitowoc, Wisconsin

MANITOWOC

stated to be $413,489, and the assets are listed at $585,000 exclusive of patents, goodwill, etc., with a book valuation of $474,847. The Independent Paper Mills, Inc., manufacture paper napkins and other paper products.

Ernst Mayer, importer of papermaking materials, has moved his offices from 127 Spring street to larger and very centrally-located quarters at 396 Broadway, New York. Mr. Mayer represents as agent some of the largest packers and exporters of papermaking rags in Europe.

H. G. Craig & Company, Inc., paper merchants and mill agents, have leased new office quarters on the twelfth floor of the New York Central Building, now nearing completion at 230 Park avenue, New York, and will remove from 17 East Forty-first street to the new location as soon as the new building is ready for occupancy.

NORTHERN NEW YORK NEWS

St. Regis Re-elects Directors

Directors of the St. Regis Paper Company of Watertown have been re-elected for the coming year. They are: Jonathan Bulkley, Floyd L. Carlisle, W. K. Dick, R. B. Maltby, Alvah Miller, H. E. Machold, A. M. Dick, C. E. Norris, R. K. Ferguson, B. B. Taggart, all of New York; D. C. Middleton, D. M. Anderson, J. N. Carlisle, F. A. Empsall, all of Watertown. and J. J. Warren of Brownville.

A. P. M'Kinnon of Montreal, Canada, who has been in charge of all of the timber lands of the St. Regis Paper Company in Canada has been placed in charge of all timber lands in the United States and Canada. He succeeds Carl B. Martin, who has been sent to the New York office of the company.

The Dexter Paper Co. and the Sherman Paper Co., both of Watertown, are endeavoring to purchase property on the St. Lawrence River front at Morristown, N. Y., to establish a pulp wood terminal. The terminal would take care of shipments of pulp wood down the St. Lawrence from the timber tracts in Canada.

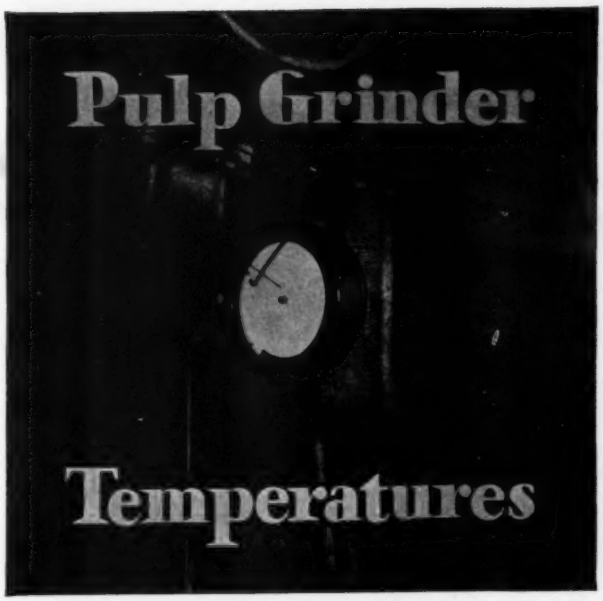
The Racquette River Paper Company at Unionville has received a carload of pulpwood from Russia which it will use in experimental purposes at its mills. The wood is spruce, considerably whiter than that obtained in the Adirondacks or in Canada. Transportation costs are the chief factor in its use.

The International Fibre Board Company, subsidiary of the International Paper Company, is seeking to establish a board mill in Ogdensburg, N. Y. The International Company owns the Ogdensburg pulp wood terminal and the Degrasse Paper Mill at Pyrities.

Frank A. Augsbury was re-elected president of the Algonquin Paper Corp. of Ogdensburg at the annual meeting. Others renamed were: Vice-president, Clarence S. Cook of Canton; secretary and treasurer, William E. Westbrook; directors, F. A. Augsbury, W. S. Augsbury, Samuel M. Williams, C. S. Cook and William E. Westbrook. The Algonquin Mill produced 30,953 tons of paper during the past year. This was 2,379 tons more than in 1927. The entire product goes to the New York American for use in printing the comic supplements and the magazine sections of the Sunday issue.

The West End Paper Mill at Carthage closed for a short time for alterations to machinery.

The paper mill at Natural Dam, N. Y., owned by the Oswegatchie Paper Company, Inc., has shut down owing to lack of orders. The plant produced 50 tons of newsprint daily. The Oswegatchie Company is associated with the



American Recording Thermometer on a pulp grinder, Canadian International Paper Co., Three Rivers, Quebec, Canada.

If a record is kept of pulp grinder temperatures, the stones may be maintained at a uniform temperature. Just enough cooling water may be admitted for the best grinding and to prevent breakage of stones.

This is only one use of American Recording Thermometers to increase the efficiency of paper mills.

Specify Catalogs Desired

Recording Thermometers.....H-41
Glass Thermometers.....F-41
Dial Thermometers.....G-41
Recording Gauges.....E-41
Sulphite Gauges.....A-41
Paper Machine Tachometers...O-41
Temperature Controllers.....R-41
Ashcroft Paper Tester.....C-41
Ashcroft Thickness Gauge.....L-41

AMERICAN INSTRUMENTS

Since 1851

CONSOLIDATED ASHCROFT HANCOCK CO. INC.
Subsidiary of Manning, Maxwell and Moore, Inc.
100 East 42nd Street, New York City

The "M. & W." Two-Drum Winder

increases dividends by saving time when changing slitters

In almost all cases the well-known "M. & W." Four-Drum Winder is the right winder to use. Winding Rolls independently saves the finished product.

For some special work the "M. & W." Two-Drum Winder equipped with patent removable bottom slitters is more suitable, especially where several rolls are wound on one shaft.

We are now prepared to supply Two-Drum Winders, when preferred, to Four-Drum Winders, and would call attention to some of their new features, as follows:

1. Automatic tension regulation—Raybestos discs brake.
2. Spreader for web of paper before slitting.
3. No bottom slitter shaft. Bottom slitters independently driven and removable, same as top slitters.
4. New type of spreader and separator prevents weaving together.
5. Electric power lift for regulating hardness—and for removing heavy rolls from winder to truck.
6. Improved motor drive—with slow and variable high speed.

(PATENTS PENDING FOR THESE IMPROVEMENTS)

Fitted with plain or collapsible shafts—
For rolls 6" wide and over
Up to 60" diameter or more

FURTHER PARTICULARS UPON REQUEST

The MOORE & WHITE Co.
PHILADELPHIA, PA.
N. PHILA. STA. PENNA. R.R.
PAPER MILL MACHINERY

West End Paper Company of Carthage, both owned by the Caswell and Wardwell interests of Watertown.

One hundred and fifty feet of flume of the Carthage Pulp and Board Company on the Black River was torn away by huge ice cakes. The damage hampered operations of the mill for a short time.

Fire which broke out in a coal bunker, caused damage to the Racquette River Paper Co. mill at Unionville.

Financial circles are convinced that something important is brewing in the affairs of the Northern New York Utility group, which will rebound to the advantage of the shareholders in these organizations. According to reports the St. Regis Paper Company, because of its stock control of Northeastern Power Corporation has a key position in the power situation. St. Regis owns three shares of Northeastern for every share of St. Regis. The merger when it comes about will include Mohawk Hudson, United Gas Improvement Company, Buffalo, Niagara and Eastern Power Corporation, besides St. Regis and Northeastern.

Warren and Harmon Companies Elect Officers

John J. Warren was re-elected president and treasurer of the Warren Parchment Company of Dexter, N. Y., and the Harmon Paper Company, Brownsville. Other officers of the Warren Company are: W. J. Argy, assistant treasurer; R. E. Skinner, secretary. Officers of the Harmon Company are: W. J. Argy, assistant treasurer; R. E. Skinner, secretary; F. M. Boyer, assistant secretary.

The Warren Company's directors are: J J. Warren, R. E. Skinner. D. F. Warren, W. J. Argy and A. E. Warren. The Harmon Company's board is composed of: J. J. Warren, W. J. Argy, R. E. Skinner, F. M. Boyer and D. F. Warren.

Forestry Notes

A program for the reforestation of 850,000 acres of idle land throughout the State of New York has been launched by the State Reforestation Commission. Comprehensive legislation to give the plan effect has been proposed and approved and bills authorizing the initiation of the work with an appropriation of $100,000 will be introduced in the State legislature.

Assemblyman Clarence L. Fisher of Lewis County, has introduced a resolution in the State Legislature to remove all doubt as to the constitutionality of the $100,000 emergency fund for fighting forest fires, to be made available by special authorization of the Governor. The resolution has been approved by the Conservation Commission and the Attorney-General.

Directors of the International Pulp Company and the Oswegatchie Light and Power Company of Gouverneur were elected as follows: M. M. Belding, S. J. McCrimlisk, W. H. Stillharter of New York; F. N. Belding of Rockville, Conn.; William C. Geer, Frank P. McCarthy and W. D. Mahoney of Troy and Michael Doyle and Kendall B. Castle, Rochester. Officers are: president, Michael Doyle; vice president, William C. Geer; treasurer, M. M. Belding, and secretary, S. J. McCrimlisk. John J. Wallace is superintendent and manager.

George S. Sisson, Jr., president of the Racquette River Paper Company of Potsdam, has been elected vice president of the American Jersey Cattle Club. He was formerly president of the American Paper and Pulp Association and is now a director of that organization. He is president of the New York State Forestry Association and a member of the Society for Preservation of Forests.

George W. Knowlton, 89, dean of papermakers in the United States and president of the Knowlton Brothers Paper Company of Watertown, has been re-elected chairman of the board of directors of the Watertown National Bank.

LENIX Equipped 300 H.P. Fan Drive

For Transmitting Brute Power

—use a high grade belt and the* LENIX *Drive

There's nothing delicate about many of the drives in a paper mill. Beaters, rod-mills, pumps, paper machines—all take brute power.

Experience has shown that about the best combination is a high grade belt equipped on short centers with the LENIX.

As one paper mill operator using a number of LENIX equipped drives said:

"We notice three advantages in particular: more power is transmitted, the power is smoother and belt life is longer."

All this means lower costs for transmitting power and for running machinery—items not to be ignored in running plants involving heavy machinery. Why not secure the advantages of the LENIX for your mill?

F. L. SMIDTH & CO.

Engineers *Incorporated 1895*

225 Broadway, New York, N. Y.

Certain Operating Facts about the LENIX that Emphasize its Value in Solving Power Transmission Problems.

It is the one device that makes practical high belt speeds—4,000 to 8,000 F. P. M.

It is the one device that permits use of any pulley ratios that building space permits. Fifteen to one and higher are practical.

It is the one device that permits the use of standard stock pulleys, should a change in pulley ratios be desired.

The* LENIX *Drive

Reg. Trade Mark

And now the No. 1

EMERSON JORDAN

TIMKEN EQUIPPED

The bearings on the new No. 1 Emerson Jordan are Sleeve Mounted Timken Roller Bearings. The end bearing shown above takes care of both radial and thrust which is close-coupled with thrust screw and pressure concentric with the center of the shaft.

Both bearing units are mounted on taper-bored renewable sleeves and are readily demountable because not mounted directly on the shaft. They are enclosed in sealed housings.

These strong, dependable Timken bearings are typical of the engineering and care in construction which marks the Emerson Jordan throughout. You can put in an Emerson Jordan with full assurance of lasting efficiency and thoroughly dependable, continuous performance.

Let us submit estimates and prices.

The EMERSON MANUFACTURING COMPANY
Lawrence - - - - Massachusetts
DIVISION OF JOHN W. BOLTON & SONS, INC.

2610

NEW ENGLAND NEWS

Official Changes at Great Northern

Election of a successor to Fred A. Gilbert, first vice president of the Great Northern Paper Co., was one of the interesting features of the past month in New England and indeed, the retirement of Mr. Gilbert from the company to which he had given so many years of service was received in mill circles with considerable surprise. Mr. Gilbert whose office was in Bangor, Me., was a close associate of the late Garret Schenck, founder, and until his death president of the company. He had immediate supervision over the company's mills in Maine. In leaving Great Northern, Mr. Gilbert embarks on an ambitious undertaking in New Brunswick, in association with the Lacroix Corp., a new company which is developing a large tract of timberland near Campbellton, the primary production of which is to be lumber, but undoubtedly will produce some pulpwood for the market.

William Hilton of Bangor has been elected vice president and manager of the spruce wood department. Mr. Hilton was born in Chesuncook, Maine, educated in Greenville and the University of Maine graduating with a B. S. degree in civil engineering in 1911. He was associated with James W. Sewall, forester of Old Town for a time, and acquired valuable experience in timber estimating. In August, 1912, he became connected with the division of forest engineering of the Great Northern Paper Co., becoming superintendent of the department in 1917 which also placed under his supervision the building of roads, dams and new buildings as well as all matters related to forest policy, inspection and scaling. He was made assistant manager junior only to Mr. Gilbert on February 1, 1928.

Great Northern now has three vice presidents, the others being H. Merton Joyce, manager of sales, and Wm. O. McKay in the Boston office. William O. Whitcomb was reelected president; B. C. Ward, treasurer. Directors of the company include Lewis Cass Ledyard, L. W. Ledyard Jr., Mr. Whitcomb, Eugene Hale, F. S. Rollins, Sheldon E. Wardwell, Mr. Joyce, John Hay Whitney, and Hilbert Van Nydeck Schenck of Boston.

W. F. Whiting Addresses Boston Chamber

Secretary of Commerce William F. Whiting, Holyoke paper manufacturer, addressed the Boston Chamber of Commerce on February 4, his topic being the function of Chambers of Commerce and the varied work of the Department of Commerce. A large group of paper men attended the meeting, the total attendance being 650, completely filling the main dining room of the Chamber.

Mr. Whiting outlined the functions of the Department of Commerce and also described what he conceived to be the paramount purposes of a chamber, among which he indicated was the upbuilding of the entire tributary area not stopping at the city limits. The Boston Chamber in other words should have the interests of the greater city and to a certain extent of all New England at heart.

Board Mill Activities

The United Paper Board Company's mill at Benton Falls, Me., which was placed in operation some weeks ago, has closed for a period during which time important alterations are contemplated.

The pulp mill at Yarmouth, Me., formerly owned by S. D. Warren Co., and which was sold to a group headed by F. B. Oldham may be operated as a board mill according to current reports. Officials of the Warren Company confirm the sale and add that the mill had not been operated by them for some time as it was of no further use to them. Mr. Oldham was formerly associated with the Auburn Paper Box Co., later he manufactured folding boxes in his own plant and more recently has been connected with a board mill at Latrobe, Pa.

The Davis Paper Co., West Hopkinton, N. H., is down for

RYERSON

Immediate Shipment from Stock

Bars, Shapes, Structurals, Rails, Plates, Sheets, Rivets, Bolts, Nails, Wire, Chain, Turnbuckles, Shafting, Boiler Tubes, Boiler Fittings, Corrugated Sheets, Concrete Reinforcing, Welding Rods, Babbitt Metal, Tool Steel, Bar Iron, Refined Iron, Floor Plates, Safety Treads, Small Tools, Machine Tools, etc.

Write for the Journal and Stock List—the "key" to Immediate Steel.

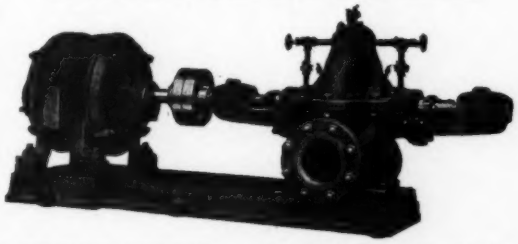
JOSEPH T. RYERSON & SON INC.

Chicago Milwaukee Buffalo St. Louis New York Cincinnati Boston Detroit

STEEL

LAWRENCE "VORTEX" CENTRIFUGAL PUMPS

Built for Every Need in the Paper Industry



LAWRENCE "VORTEX" type S.S. Single Stage, Double Suction, Horizontal Split Casing, Enclosed impeller Pumps

Designed for maximum efficiency against moderate and high heads, and for operating at high speeds. Standard pumps are bronze fitted throughout. Internal hydraulic balancing device which automatically eliminates all end thrust. Oversize Ball Bearings mounted in dust and grease tight housings.

They are built for continuous service. Year in—year out.

Our Engineers are always ready to help you with pumping problems. Write for Bulletins.

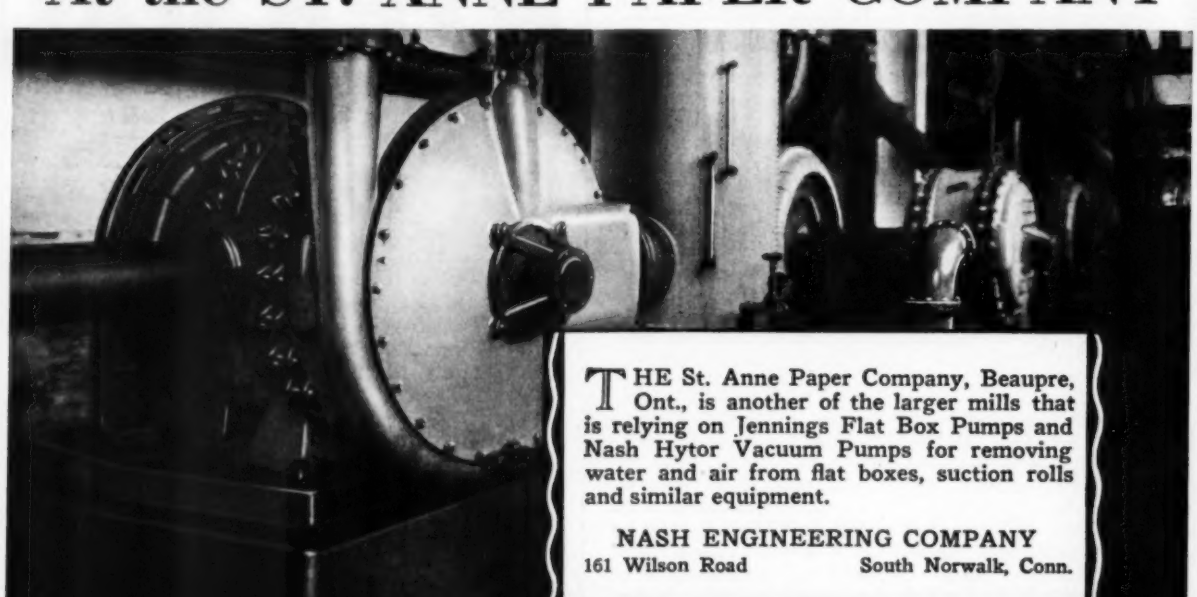
Lawrence Pump & Engine Co.

P. O. BOX 70,

LAWRENCE, MASS.

N. Y. Office—90 West St.

At the ST. ANNE PAPER COMPANY



THE St. Anne Paper Company, Beaupre, Ont., is another of the larger mills that is relying on Jennings Flat Box Pumps and Nash Hytor Vacuum Pumps for removing water and air from flat boxes, suction rolls and similar equipment.

NASH ENGINEERING COMPANY
161 Wilson Road South Norwalk, Conn.

Nash Hytor
VACUUM PUMPS AND COMPRESSORS

A Mill Owner's Experience

For a great many years we had made repeated efforts to have a certain, well known mill try our Fourdrinier Wires. But the owner declined on the grounds that he was favoring us with a large portion of his wire cloth and Dandy Roll business. We exhausted every argument, but to no purpose. Our appeals fell on deaf ears. The mill owner remained absolutely adamant.

Then came the day when he heard that our wires were giving phenomenal runs at another near-by mill. He investigated, and after he had confirmed the report, ordered a wire. Later he ordered two wires. Today he is on our list of "Make and Hold" customers. Your experience will be like his if you give our Fourdriniers a trial. That is inevitable.

We also invite you to try our Cylinder and Washer Wire Cloth, Dandy Rolls and Cylinder Moulds.

CHENEY BIGELOW WIRE WORKS

Established 1842 *Springfield, Mass.*

a short period, during which it will rearrange the dryers on its board machines, adding several and eliminating equipment for making mill lined board. The additional dryers it is estimated will increase the output ten to fifteen per cent.

The automatic paper box machine invented and patented by Mark B. Claff, late proprietor of the paper box company of that name at Randolph and Brockton, Mass., will continue to be made by the company, ownership in which has been inherited by four sons, three of whom are actively interested in the business. The machine is said to be one of the most successful of its type converting board in rolls into a finished box at one operation. The machines are constructed at the Pneumatic Scale Co., Norfolk Downs, Mass.

Another T. & H. Directory

Tileston & Hollingsworth Co., the only paper manufacturing company within the city limits of Boston has issued another directory in its series, this one being a compilation of leading engravers and printing ink manufacturers of New England.

The analysis of the T. & H. calendar made by V. Winfield Challenger of the N. W. Ayer Co., of Philadelphia before the Boston Club of Printing House Craftsmen will be followed by similar talks before the Craftsmen's Clubs in Providence on February 13 at the Narraganset Hotel, at Concord, N. H., the following evening, and later in the month at Hartford, Conn. The last named gathering will obtain its calendar analysis from James G. Clarke of the Wood Clarke Press.

The Oxford Paper Co., following the stock dividend and retirement of its old preferred stock, has floated an issue of 66,000 shares of series A cumulative preferred stock at the price of $99. It was reported over subscribed immediately.

I. P. Plans Huge Project

The latest International Paper Co. project equals the enormous but successful undertaking of the Fraser Paper Co., at Madawaska, Me. It is proposed to build paper mills at Van Buren, Me., one to manufacture sulphite papers, the other to make kraft. A mill will be constructed at St. Leonard on the New Brunswick side of the St. John River to manufacture sulphite pulp for transmission across the river and border to the paper mill in Maine. Instead of using the International bridge as is done at Madawaska the Van Buren project will include a pipe line for the liquid pulp built on supports constructed and owned by the Company.

This gigantic development, however, depends on passage of a bill before the Maine Legislature permitting the company to dam the waters of the Fish River and its lakes. The same bill in a different form was refused two years ago; they proposed to dam the stream, but Aroostook County objected that it would cover too much land and because the power so developed was not pledged for industrial use in the United States. Both these objections have been met. The mill building is already referred to while the flooding has been averted by a proposal to have many dams at each lake and hold back a smaller quantity of water at several places, rather than a large body at one spot.

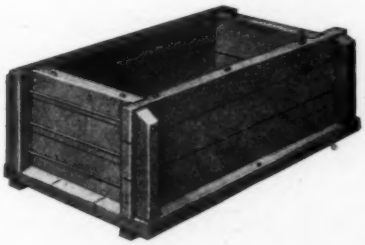
Container Manufacturers Acquire New Mills

Two of the largest aggregations of capital in the paper board industry have made important expansions in New England recently by acquiring corrugated board and container property. The first move in this direction was made by the Container Corporation of America when it purchased the plant and machinery of the Corrugated Paper Mills Inc., of Natick, Mass. This is a fine modern plant equipped to manufacture corrugated board and many forms of containers. It will be supplied with raw board for conversion by the Philadelphia plant of the Container Corporation.

The Robert Gair Co., has proceeded along somewhat similar lines by purchasing the Warner & Childs Co., Inc., one of the largest corrugated board and container manufacturers in the East and a firm with which it has had close business relations for some time. No change in personnel was effected. The

Standardize On

STEARNS TANKS



We are equipped to manufacture any type of wood tanks. Our engineering department supervises the construction of special tanks in our own modern tank factory.

Our box tanks range in capacity from 25 gallons to 30,000 gallons. Round tanks in a great variety of diameters and heights range in capacity from 25 gallons to upwards of 125,000 gallons.

A Stearns Tank is a Long Life Tank because it is constructed of the right kind of wood for the specific use it is to be put to.

Let our engineering department assist you to solve your tank problems.

The A.T. Stearns Lumber Co.
Neponset, Boston, Mass.

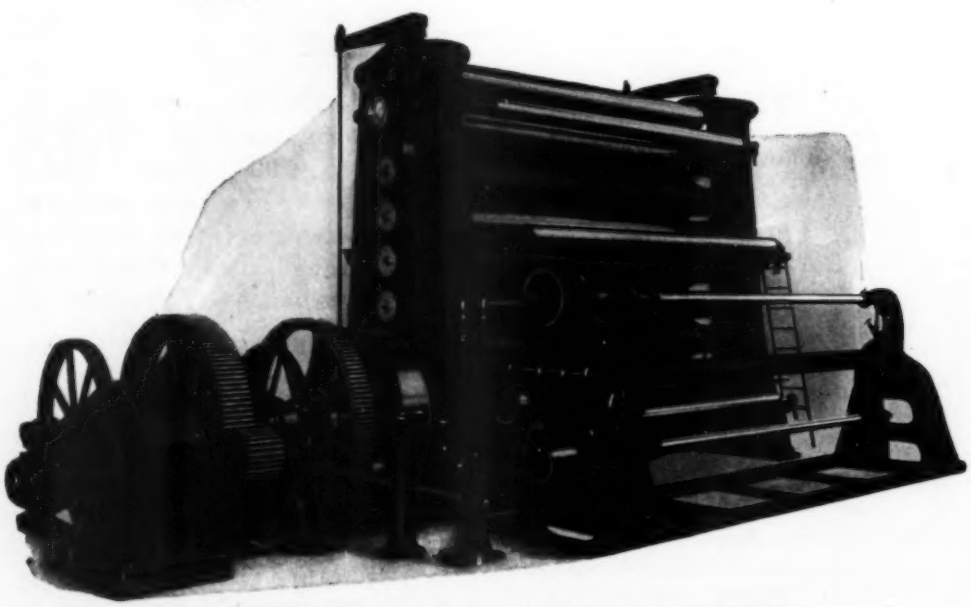
STEARNS TANKS

HOLYOKE

SUPER CALENDERS *and* Experience

Experience does not come over night,—not in the designing and building of Super Calenders. It is the result of long years of intimate study of the daily dozens of difficulties to be overcome in the Paper Industry. For 65 years the HOLYOKE MACHINE COMPANY has built Quality and Superior Performance into every HOLYOKE MACHINE. When planning purchases of equipment consult with HOLYOKE Engineers, Holyoke Machine Co., Holyoke, Mass.

Manufacturers of Super Calenders, Platers, Cotton and Paper Rolls, Washing and Beating Engines, Wood Pulp Grinders, Barkers, Chippers, Rag and Paper Dusters, Rag Cutters, Hydraulic Pumps and Presses, Hercules Water Wheels and Governors.



The HOLYOKE MACHINE COMPANY

FOUNDED 1863

board used will be supplied by the Gair mills, presumably those at Haverhill or New London, Conn.

Details of the Strathmore Paper Co., stock dividend equal, in reflecting an excellent financial condition, the distribution effected by Oxford. Like the Maine company, the Bay State concern made its stock dividend payable to stockholders of record at the end of 1928. The company filed a certificate with the Commissioner of Corporations at Boston increasing its capital stock by 20,000 shares of 6 per cent preferred and 20,000 shares of common stock, both of $100 par. Of this, 2,500 shares were sold for cash, and all of the preferred and 15 shares of common were given to stockholders in the ratio of a new preferred and three quarters of a share of new common for each four shares of common held.

Super-Craftsman Club

A movement has been inaugurated for the organization of a club to be known as the Super-Craftsman Club, for which permanent quarters have been leased in the Lincoln Building, Holyoke, Mass. Active membership in the club will be open to members of the Connecticut Valley Division Paper Mill Superintendents and the Connecticut Valley Club of Printing House Craftsmen. Associate membership, which carries with it all the privileges and advantages of the club except voting and holding office, is open to any owner, executive, superintendent, sales manager, purchasing agent, cost accountant, etc., of any industry related to the paper or printing industries.

This activity is the result of joint fraternal assemblies previously held by the members of these so closely allied industries. John J. White of Holyoke, is president.

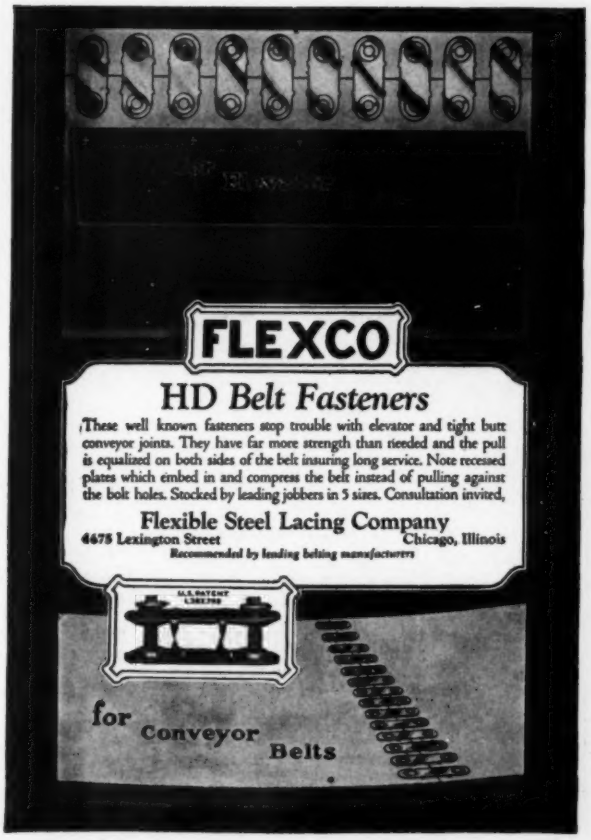
Frank B. Cummings, for many years a paper merchant formerly with the Whitaker Paper Co., in the west, then in Boston, and from 1920 to 1926 with Storrs & Bement Co., leading paper merchants, during the most of that time as president of the company, has completed arrangements which will bring him into the manufacturing end of the industry, holding a most responsible position with Hollingsworth & Whitney Co. Mr. Cummings' connection with H. & W. will be effective on March 1st, and his office will be at the company's headquarters, Atlantic Building, Boston.

New England Freight Association turned a deaf ear to the pleas and threats of the New England Paper & Pulp Traffic Association when that organization requested a postponement of rate increases on woodpulp from Maine Central R. R. points and from Grand Trunk R. R. points, notably Berlin to M. C. points. The rates await formal publication, whereupon it is expected that the shippers will ask the I. C. C. for suspension and hearing.

Every paper company operating in Northern New England timberlands reports weather conditions ideal for the transportation of pulpwood either to railroad lines, or to river banks to await the spring drive. There is just enough snow and it has fallen at intervals to keep runners on a good sliding surface. Thousands of cords of pulpwood in Aroostook and Washington Counties, Maine, are being moved to the river banks this month.

Charles G. Neidel of Springfield, Mass., has been appointed secretary to S. L. Willson, president of the American Writing Paper Co. Mr. Neidel has recently been active in the handling of sales for export and prior to that was secretary to Carl Lincoln, general sales manager. Mr. Neidel succeeds William J. Norton, who has been appointed treasurer of the company.

William B. Stevenson, president and treasurer of Storrs & Bement Co., one of the largest New England paper merchants, passed away last month following an operation. His death coming at the comparatively young age of 45 years shocked his many friends among mill men and merchants. He started in as a mill man and was agent in Boston for the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HD Belt Fasteners
These well known fasteners stop trouble with elevator and tight butt conveyor joints. They have far more strength than needed and the pull is equalized on both sides of the belt insuring long service. Note recessed plates which embed in and compress the belt instead of pulling against the bolt holes. Stocked by leading jobbers in 5 sizes. Consultation invited.
Flexible Steel Lacing Company
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Recommended by leading belting manufacturers
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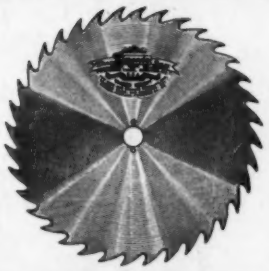
SIMONDS

Circular Saws and Machine Knives



For pulp and paper mills it is economy to use Simonds Saws and Barker, Chipper and Paper Cutter Knives because they hold their edge longer and cut faster. They are backed by a near century of experience. Write for catalogue and prices.

Simonds Saw and Steel Co.

Established 1832
Fitchburg, Mass.

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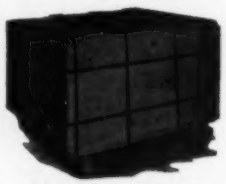
Use Signode Strapping for Paper Shipments

Signode has proven exceptionally valuable in binding paper firmly to the skids for shipments. The Strapping is flat and uniform, the Seals are strong and dependable and the tools are remarkably efficient.



Skid shipment from the Champion Coated Paper Company. Note the strong safe bands of steel locked securely in Signode Seals.

Signode is also used on practically every other type of paper shipment including boxes, cartons and frames. The strapping reinforces at the weakest points and insures safe arrival at the least possible cost in time and materials.

Signode usually permits a lighter container and in this way also reduces the freight bill.

We will be pleased to demonstrate at your request or send catalog No. 15.

Signode Steel Strapping Co.
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SIGNODE
***The* Sealed Steel Strapping**

We also manufacture round wire, tensional reinforcements, all forms of nailed strapping, pail clasps, cluteh nails, tag fasteners, etc. Write for general catalog.

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BUNDLING PRESSES
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PRINTING DEVICES
Towel Interfolding Machines

Paper Converting Machine Co.
Green Bay, Wis.

YES he's knocked out by falling pulp !!

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OVER 4,300 American companies have reduced their accidents even as much as 90 percent through the services of the National Safety Council—the only non-profit national accident prevention organization for industry. This accident prevention service, developed by foremost safety engineers, is complete. It has saved Council members millions of dollars. At a low price, you too can get the assistance in Safety work that your company needs.

You, as a member of the National Safety Council, will receive each month a selection of forty two-color accident prevention posters—strikingly illustrated. This is a definitely planned program to educate your workmen in Safe Practices—to reduce your accident costs. A sample poster in miniature is shown at left.

The National Safety News, an eighty-page magazine, will be sent to you each month. You will find its articles practical—inspiring—of real service.

In addition, you will be privileged to call upon the Council's staff of trained Safety engineers, editors, and librarians for information and advice on your accident prevention problems. At your disposal is the Council Library—the most comprehensive collection of safety knowledge in existence.

Investigate the services of the National Safety Council—only partly covered in the foregoing paragraphs. Kimberly Clark, Long Bell Lumber Company, and hundreds of other small and large companies use it profitably. Why not you? Return the coupon for full information.

Valley Paper Co., for several years before joining Storrs & Bement Co. Delegations from the National Association, the Boston Paper Trade Association and the New England Paper Merchants Association attended the funeral services.

Merrimade Folding Enamel is a splendid new product of the Merrimac Paper Co., Lawrence, Mass., who are appointing agents for the line.

Thomas E. Allen general agent of the Munroe Felt & Paper Co., of Lawrence Mass., died January 7 in the mill office. Death was sudden due to heart disease. Mr. Allen advanced to his responsible position from that of office boy.

William D. Slater, the original manufacturer of envelopes by modern methods, died at Springfield during the past month. With Elisha Morgan he formed the Morgan Envelope Co., in 1864, which later became a division of the United States Envelope Co., and he continued with that firm until his retirement in 1920. He developed machinery for the manufacture of envelopes including that widely used window envelope.

It is reported that arrangements have been completed for building a new railway line in Northern Maine extending 110 miles from LAC Frontier, a connection with the Quebec Central Railway, to Washburn, Me. The projected road will traverse some of the richest timber lands in the territory. A large portion of the timber along the line is owned by the International Paper Company.

W. B. Clements, assistant general superintendent of the Fitchburg Paper Co., Fitchburg, Mass., has resigned. Mr. Clements was for many years superintendent of the Riverside Paper Company Div. of the American Writing Paper Co. His plans for the future are not definite.

Art In Industry Bond, the new lined background paper of beauty, developed by Taylor Logan Co., of Holyoke is now placed with distributors and has proved a decided success. It is aimed to meet the demand for an artistic paper for letterheads.

William A. Norwood, assistant advertising manager of the Dennison Mfg. Co., Framingham, Mass., was the victim of a tragic accident on January 28, when accompanied by his fiancee his automobile skidded at a railroad crossing and crashed into a train. Mr. Norwood was killed outright and the young lady is not expected to live.

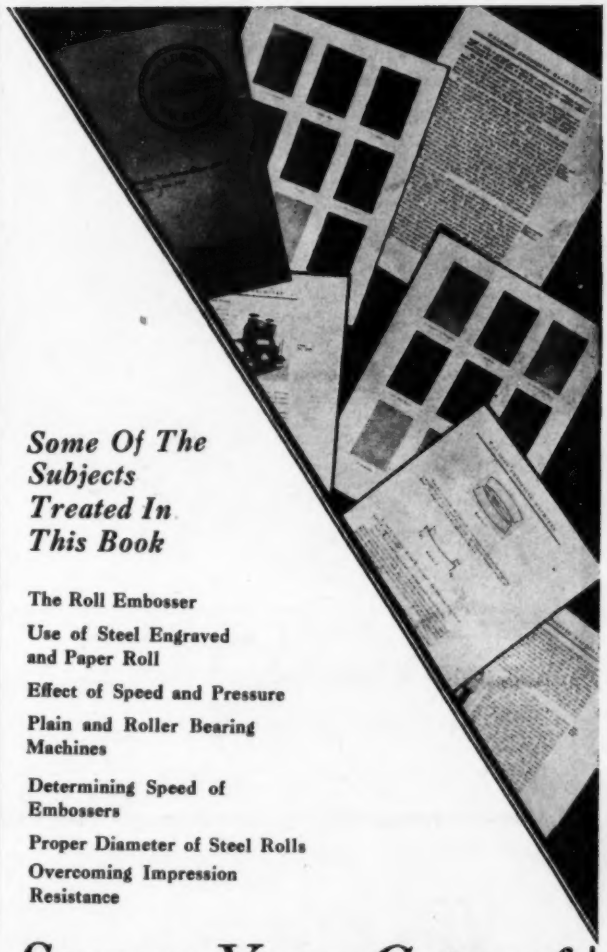
WISCONSIN NEWS

Badger Paper Mills, Inc.

The Peshtigo Paper Co., Peshtigo, Wis., was sold January 23, to a corporation known as the Badger Paper Mills, Inc., for $250,000. Edward A. Meyer, who successfully managed the Marathon Paper Mills, Rothschild, Wis., and the Menasha Products Co., Menasha, Wis., is to be head of the new concern and is understood to have invested a considerable sum in the enterprise. Early reports were that the new company would be known as the E. A. Meyer Paper Co.

It is hoped that the purchase of the Peshtigo Paper Company by the new owners will remove permanently the difficulties which have beset this war time venture. The deal included a pulp mill and a two machine paper mill with all equipment. The inventory value was placed between $2,000,000 and $3,000,000 but the only bid for the property was one of $250,000 made by Morris F. Fox, of Morris F. Fox and Company, investment brokers, of Milwaukee, Wis. Mr. Fox represented a bondholders' protective committee. By order of the court, the sale was conducted with the removal of all encumbrances except tax liens.

Outstanding indebtedness of the company was $1,354,359.57, or $1,163.03 on each $1,000 bond. It was shown dur-



Some Of The Subjects Treated In This Book

The Roll Embosser

Use of Steel Engraved and Paper Roll

Effect of Speed and Pressure

Plain and Roller Bearing Machines

Determining Speed of Embossers

Proper Diameter of Steel Rolls

Overcoming Impression Resistance

Secure Your Copy of This Instructive Book!

SENT WITHOUT COST OR OBLIGATION

Attractively bound with a Waldron Embossed stock cover, this book presents an authoritative treatise on the principle and practices of modern embossing. It contains engineering data of practical value to every embossing operator and executive—data that is probably not available from any other source. The various types of embossed paper and materials are described, and also the modern machines that are producing the effects and finishes.

Every executive with an eye on the bright future for converted paper will find this book of timely value. Write for a copy on your business stationery.

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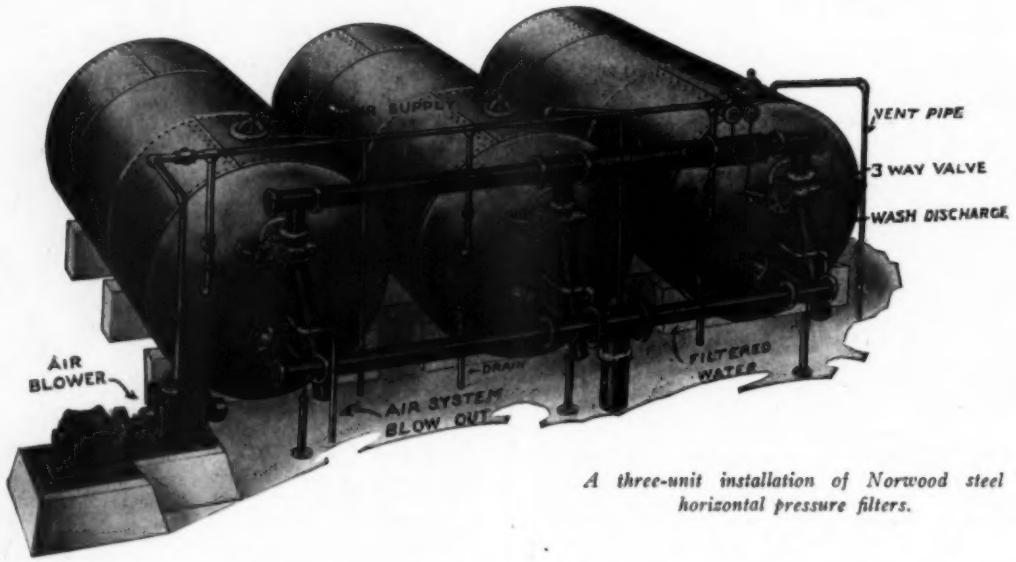


A three-unit installation of Norwood steel horizontal pressure filters.

Solving Filteration Problems with Sensible Engineering

NORWOOD Filters have been developed and improved by engineers of long experience in meeting and solving filtration problems in the paper mills. Their construction, durability, ease of operation and dependability are the result of the application of sensible engineering principles to the paper mills' filtration problems.

Norwood's engineers are helping mills save money by analyzing their filtration problems and making installations of efficient Norwood three-unit pressure or gravity filtration systems to economically and efficiently remove pollution and foreign matter from water taken directly from rivers and other natural water supplies.

You can't go wrong with a Norwood installation of Filters, Calenders, Platers, Dusters, Rag Thrashers, Folding Machines or other equipment. Ask for catalogs and specifications.

You can improve the quality of your paper and reduce the proportion of "seconds" by efficient filtration. Norwood's engineers will gladly help you get to the bottom of your filtration problems. Now is the time to look into the advantages and economies of Norwood filtration for your plant—before Spring floods fill your water supply with dirt and debris. Ask for Norwood Filter Catalogs, and ask our engineers to help you solve your filtration problems, without obligation.

Norwood Engineering Co., Florence, Mass.

NORWOOD

ing the receivership management by P. M. Allen that the mill could operate profitably, but it was impossible to carry the fixed overhead of interest and other obligations of the years when the company began getting into difficulties. Appeal therefore was made to the courts to remove the encumbrances. This was the fourth attempt to sell the mill at auction, and this time arrangements had been made to bid on the property. The circuit court has confirmed the sale on the above basis.

Capitalization of the new company will be: $400,000 par value of 10-year 6 per cent sinking fund first mortgage bonds; $715,000 par value of 6 per cent preferred stock, and 65,000 shares of common stock of no par value. Holders of the 7 per cent first mortgage bonds of the Peshtigo company are to receive in exchange one share of preferred stock in the new company with a par value of $50, and one share of common stock without par value. Mr. Meyer receives for his investment 2,000 shares of preferred stock and 2,000 shares of common.

Operation of the mill will be under way at once on the bond tissues which has been manufactured in the past. Changes will be made so that wax paper can be made and printed. Many of the employees already are back at work making preparations. The mills were shut down for over two months because of lack of money with which to buy raw materials.

Group insurance has been provided for employees of the Great Western Paper Company, of Ashland, Wis. Each has life insurance of $2,000, and sick benefits of $2 to $3 a day, as well as accident and dismemberment benefits. Premiums paid by the employees amount to 60 to 75 cents a week and the company assumes the remainder.

Sears, Roebuck Sells Lakeview Mill

The Lakeview Paper Company, Neenah, Wis., owned since 1920 by Sears, Roebuck & Co., Chicago, and which has been producing paper for mail order catalogues has become the property of interests representing the Abitibi Pulp and Paper Company, of Canada, and the Mead Pulp and Paper Company, of Dayton, Ohio. This same organization recently purchased the Thunder Bay Paper Company, of Port Arthur, Canada, a subsidiary of the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis.

In 1911 a group of capitalists of the Fox River Valley built the Lakeview mill, which at that time was known as the Lakeside Paper Company. The company was headed by E. J. Lachmann. Production since it was owned by the mail order house has been forty tons daily on two machines, 110 and 114 inches, respectfully. Philip Nash has been the manager.

Among the recent deaths were those of Edward Shields, who was superintendent of the Hoberg Paper and Fiber Company, Green Bay, Wis., for the last seventeen years, and F. M. Charlesworth, vice president of the Moloch Foundry and Machine Company, Kaukauna, Wis. The death also is announced of Mrs. Jessie W. Newton, of Waupun, Wis., mother of Harry M. Newton, president and treasurer of the American Paper Company, of Wauwatosa, Wis.

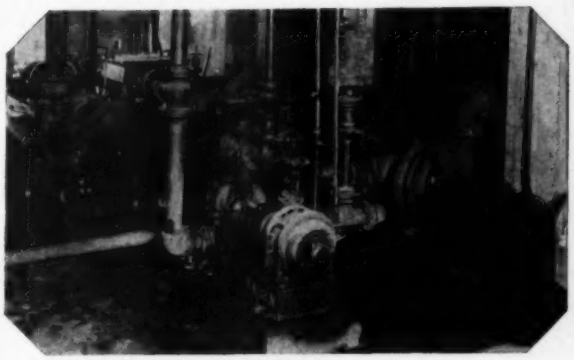
Northern Paper Mills Add Machine

Need for faster production led to a decision of the Northern Paper Mills to add a new machine at once. This announcement was made at the recent annual meeting of stockholders by W. P. Wagner, president.

This machine will be No. 7 and will replace Nos. 1 and 5. It will have a web of 175½ inches, and a production of 1200 feet a minute. Since the capacity of the present machines is only 400 to 600 feet a minute, there will be quite a change in the output. An ultimate volume of 50 tons daily is expected. The order has been placed with the Beloit Iron Works.

It was necessary to enlarge the machine room, and this was made possible by enclosing a court surrounded by sev-

Why do most new mills select Warren Pumps?



Battery of six 4" and 5" liquor and clear water pumps in a new southern paper mill.

Because the efficiency with which they handle water, liquors and pulped stocks and their economical operation and low maintenance cost have put them on a par with the best production machinery. At a time when profits depend on low production costs you cannot afford to overlook the advantages to be gained by using Warren Pumps for every pulp and paper mill service. Write for Bulletins or estimates.

Warren
Steam Pump Company Inc.
Warren Massachusetts

Atlanta Boston Charlotte Cleveland Dallas Kansas City New Orleans New York Oklahoma City St. Paul Philadelphia Pittsburgh San Francisco Toronto Scranton Seattle St. Louis

2622

Lindsay Spiral Weave Fourdrinier Wires

(Patented Oct. 1927)

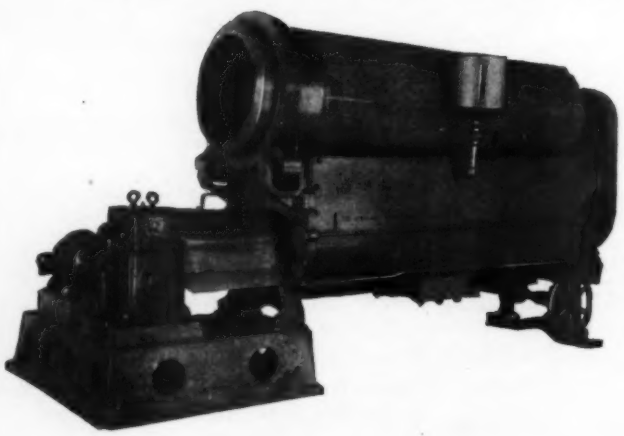
Represent the latest idea in paper machine wire cloth.

They prevent grooving of Suction Boxes, scoring and filling up of seams. This overcomes the necessity of planing the suction box covers and adds to the life and tonnage of the wires.

Lindsay Wire Weaving Company

Collinwood Station CLEVELAND, OHIO

WORM GEAR SPEED REDUCERS



In any ratios **Standard ratios in stock**

The users of this mixer have been so well pleased with the performance of their Horsburgh & Scott Worm Gear Speed Reducer drive that it is now specified as standard in their entire plant. This preference is not the result of high pressure merchandising methods but is due to one quiet efficient salesman—their original Horsburgh & Scott Worm Gear Speed Reducer. It is gratifying to know that "performance counts."

We also manufacture a complete line of Heli-Spur and Herringbone Speed Reducers. May we have your inquiries?

The Horsburgh & Scott Co.

5114 Hamilton Ave. *"Gear Makers Since '89"* **Cleveland, U. S. A.**

Gears for Every Industrial Purpose—Worm—Bevel—Herringbone—Spur—Spiral—Hardened Heat Treated Gears —Non-Metallic Gears and Pinions

eral of the buildings. A new warehouse and converting plant are just about completed, involving an expenditure of $175,000. These were constructed in anticipation of the larger production. The building is three stories, two of which will be used for storage and a third for the converting machinery. Spur tracks under cover also are provided.

Officers of the company were re-elected as follows: President, W. P. Wagner; vice president, Earle Murray; treasurer and general manager, Judson G. Rosebush; secretary and assistant treasurer, A. R. Burton.

Stockholders of the Northern Electric Company, a subsidiary of the Northern Paper Mills, held their annual meeting the same day. This company built two large dams and power plants on the Menominee river at Chalk Hills and White Rapids over a year ago. Production of power has exceeded estimates, because there has been water enough to run the generators at full capacity. Power from one of the plants is sold to the Milwaukee Electric Railway and Light Company, and the other supplies the Northern's needs.

Receivership for Menasha Paper Mills

Financial difficulties have caused the court to order a receivership for the Menasha Paper Mills Company, Menasha, Wis. This company was started several years ago to take over the defunct Island Paper Company, and has been manufacturing straw board.

Action which caused the receivership was brought by Osborn Hay and Milling Company, of Oshkosh, Wis., who had sold large amounts of straw to the mill. All other creditors were invited to become parties to the action.

J. M. Levin, one of the plaintiffs, and E. H. Jaynes were appointed as receivers. They were given permission to operate the mill for at least thirty days. This will permit bona fide orders now on the books to be filled and also will use up raw materials which otherwise might become worthless. A checkup of production will be made at the same time to learn whether straw board can be manufactured at a profit.

Capital of $275,000 has been raised to assure establishment of the new Harshberger-Theilacker Co. roofing plant at Milwaukee, Wis. The Milwaukee Association of Commerce has interested itself in the proposition and has helped in securing the funds. A suitable building will be built or purchased at once. The company will make composition on roofing from patents owned by Norman P. Harshberger.

Kaukauna, Wis. paper mills had a very satisfactory year, according to a survey made there. More orders were filled by the Union Bag and Paper Company in 1928 than in 1927. Steady operation was enjoyed with 100 men employed. The Thilmany Pulp and Paper Company has kept 650 men busy, with less labor turnover than in 1927. Paper demand was good but has undergone a slight decrease since the first of the year. Both production and sales were increased at the Patten Paper Company's mill at Kaukauna. Operation was constant, using 120 men. The Moloch Foundry and Machine Company found 1928 one of its best years in history, with 24-hour operation and a force of 185 men. Quite a number of unfilled orders were on the books January 1.

Modification of Rest Law

With final orders issued by the Wisconsin Industrial Commission, the State Rest Law at last has been modified so that it can be observed by paper mills without hardship. The old law made rest obligatory on Sunday, and men who worked on Sunday were obliged to rest on Monday.

The final order makes these modifications: Twenty-four consecutives hours of rest in each calendar week shall be deemed compliance; provisions will not apply to department and supervisory heads whose work is executive and not manual; millwrights, electricians, steamfitters and other employees whose duties call for not more than three hours of essential work on Sunday need not lay off. If the work-

Did It Ever Occur to You

That several scores of mills have brought about important economies thru the installation of new Dayton High Speed Beaters, or thru the reconstruction of old holland engines into Daytons?

Did it ever occur to you that in this day of heavy production and gradually narrowing margins of profit that

LOWER CONVERSION COSTS

simply have to be obtained and are being obtained with Dayton High Speed Beaters—in practically all kinds of mills?

Write us for list of Dayton users and data on various installations

The Dayton Beater & Hoist Co.,
Dayton, Ohio

Eastern Representatives
E. K. MANSFIELD CO.,
501 5th Ave.,
New York, N. Y.

It will pay you to get in touch with some of the Mills that use—

DAYTON HIGH-SPEED BEATERS

NOT ONLY QUICK OPENING~BUT FULL OPENING

The extra long plug having an opening area equal to that of the pipe drain gives the Barker Quick Opening Valve a full area passage for stock . . . . a decided operating advantage that adds to its economy. Easier acting . . . . smoother action . . . . will not clog, plug, or stick are other operating advantages of this valve.

The valve cylinder and plug are ground after final machine finishing to reduce the frictional area to a minimum . . . . to aid operation —and the reason why this Valve operates easier and quicker. . . . . so constructed it can be installed in limited quarters, at an angle or for vertical, horizontal and overhead lines.

For pulp and paper stocks . . . . to fit any standard or spiral pipe lines . . . . the Barker Quick Opening Valve merits your careful consideration. Write today telling us your pipe line sizes. We'll gladly quote prices—without any obligation on your part.

Green Bay

GREEN BAY BARKER, MACHINE & TOOL WORKS

Machinery Manufacturers

Green Bay, Wisconsin **Sault Ste. Marie, Canada**

BARKER QUICK OPENING VALVES

ing time exceeds three hours, the law applies to them. Regular machine employees are not exempted in any case.

Stockholders of the Nekoosa-Edwards Paper Company, at their recent annual meeting, were informed that the company had enjoyed a highly successful year. Officers and directors were re-elected as follows: L. M. Alexander, president and treasurer; John E. Alexander, vice president and general manager; C. A. Jasperson, secretary; G. W. Kibby, T. M. Hanks, J. G. Rosebush, J. B. Nash, F. J. Wood and G. O. Babcock, directors.

Saftey again proved profitable for employees of the Spruce Falls Power and Paper Company, of Kapuskasing, Canada, one of the divisions of the Kimberly-Clark Corporation, Neenah, Wis. Checks totalling $497.50 were given to 104 persons in the office, the plant crew and the townsite department because these departments operated for 290 consecutive days without a lost time accident, achieving one hundred "man years" of safety. The awarding of checks was resumed on Dec. 1, 1927 and the safety therefore covers even more than 290 days.

Establish Lake States Forestry District

In order to carry on under close supervision the extensive reforestation program planned for Wisconsin, the Federal Government has established what will be known as the Lake States Forestry district with Earl F. Tinker, formerly of Colorado and Wyoming, in charge. Headquarters have been established at the United States Forest Products Laboratory at Madison, Wis.

This new district includes Wisconsin and Minnesota. Later Indiana, South Dakota and Ohio will be added.

Funds amounting to $6,000,000 will be available for this work under an order issued by Secretary of Agriculture J. F. Jardine. This unit already contains 1,200,000 acres of federal forest reserves and at least 2,500,000 acres will be added. Tree planting is to start as soon as the acquiring of lands is well under way.

Wisconsin's forest problem also is having the attention of the state legislature, now in session. Measures are proposed so that counties can set aside lands for tree growing, where the lands have passed to the ownership of the county because of delinquent taxes. State owned forests also are being advocated.

A recent survey by the Wisconsin Manufacturers Association revealed that Wisconsin has slipped from 11th to 13th place in this country in timber production. It dropped from 1,068,612,000 feet in 1925 to 819,507,000 feet in 1927, a decline of 23 per cent, and if this rate keeps up the production will be only 62,192,000 feet in 1933, or a point nearing extinction. One-fourth of the wage earners depend on the woodworking industries. The Government's announcement of expenditures of millions on reforestation is expected to remedy this situation.

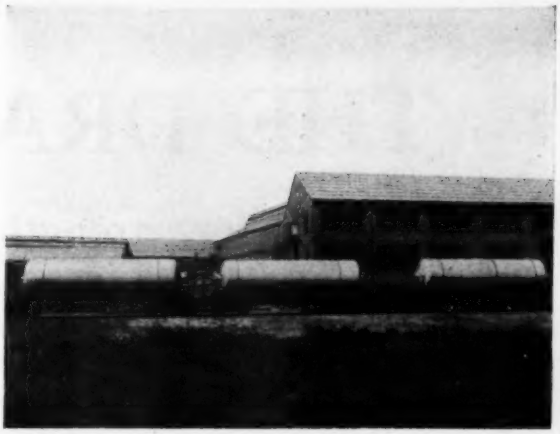
Wisconsin Has Itinerant Safety Teacher

A new series of classes in foremanship and safety is in progress in practically every paper mill center in Wisconsin. Marion W. Smith, itinerant instructor of the state vocational department, is in charge. Courses cover a period of seven or eight weeks.

At Wausau, Wis., where the idea is newer, a plan is being tried of educating the entire family on the subject of safety. The Marathon Paper Mills Company has arranged an evening mass meeting, with talks, music and a safety play. A first aid demonstration also was planned.

In a review of safety during the last year at the mills of the Consolidated Water Power and Paper Co., Wisconsin Rapids, Wis., it was found that the number of lost-time accidents was reduced from 90 in 1927 to 54 in 1928. There was one fatality in each year. The company employs 1,100 persons.

Paper mills of the Fox River Valley have been granted a reduction by the Interstate Commerce Commission from 38.5 to 35 cents a hundred pounds on carload shipments of



Kellogg Digesters
on the
Pacific Coast

THE three Kellogg Forge and Hammer Lap Welded Stationary Soda Digesters shown above were installed by the Cascade Paper Company.

These Digesters were built exactly in accordance with the A.S.M.E. Code for Unfired Pressure Vessels, and are good for a working pressure of 125 lbs. per square inch. They are 8′ 0″ I.D. x 32′ 0″ long, and have a shell thickness of 13/16″. They are complete with a charging nozzle, blow nozzle, and all necessary steam and liquor connections.

Among Kellogg installations on the Pacific Coast are the following:

Cascade Paper Company West Tacoma, Wash.	3 Units
Crown Willamette Paper Company	3 Units
National Paper Products Company	3 Units

KELLOGG

THE M. W. KELLOGG COMPANY
225 BROADWAY, NEW YORK

Birmingham, Ala.—827 Brown-Marx Building

Boston—12 Pearl Street *San Francisco*—2929 Harrison St.
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Los Angeles—742 Western Pacific Building

PI-B&W-75

THE DRAPER FELT

Unexcelled for strength, openness, resiliency, and general running qualities. Made to meet the most exacting conditions on all types of machines and all kinds of papers. Only one grade and that the highest.

Made by

DRAPER BROTHERS COMPANY

CANTON, MASS.

Woolen Manufacturers Since 1856

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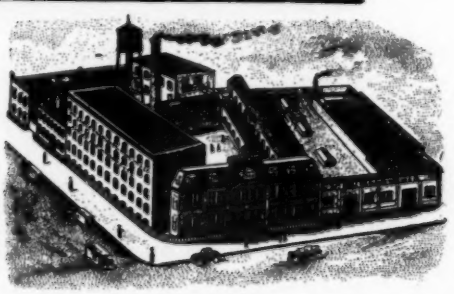
PACIFIC SALES COMPANY, Security Bldg., Portland, Ore.

THE WM. CABBLE EXCELSIOR WIRE MANF'G CO.

MANUFACTURERS OF

SUPERIOR FOURDRINIER WIRES

Backing Wires
Cylinder Faces & Washer Wires
Red Brass Brush Wire



For 80 Years we have specialized in the manufacture of brass Fourdrinier Wires, Cylinder Covers, Washer Wires and Save-all Wires as well as Phosphor Bronze Fourdrinier Wires and Cylinder Covers.

Established 1848

Offices and Warehouses:

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BROOKLYN, NEW YORK

tissue to Indianapolis, Ind. Transcontinental carriers also have granted a reduction from $1.25 to $1.10 on towels, toilet paper and napkins. These changes followed a petition from shippers showing how they were placed at a disadvantage as compared to mills in other parts of the country.

John W. Kieckhefer, president of the Eddy Paper Corporation, Milwaukee, Wis., is one of the organizers of a million dollar investment company at that city to be known as the Milwaukee Company.

George Banta, Jr., of the George Banta Publishing Company, Menasha, Wis., has been named a director of the First National Bank, of Menasha, to succeed E. A. Meyer, who has become head of the new Badger Paper Mills, Inc., Peshtigo, Wis.

MICHIGAN NEWS

K. V. P. Increases Capital

Authorized capital of the Kalamazoo Vegetable Parchment Company has been increased from $3,000,000 to $5,000,000. This action was taken at the annual meeting of the stockholders, January 23. At the same time it was voted to offer $600,000 of the stock, 60,000 shares of $10 par each, to present stockholders at the par price. The funds thus derived will be used largely as working capital.

All the officers and directors were re-elected for the ensuing year as follows: Directors: Jacob Kindleberger, C. H. Stearns, C. S. Campbell, A. B. Connable, W. O. Jones, W. E. Kidder, W. J. Lawrence, A. B. Read, and Frank Mosteller. Officers: President, Jacob Kindleberger; vice presidents, C. H. Stearns, James W. Gleenlee, Alfred Southon; secretary, Thomas W. Peck; treasurer, C. S. Campbell; general manager, R. H. Hayward.

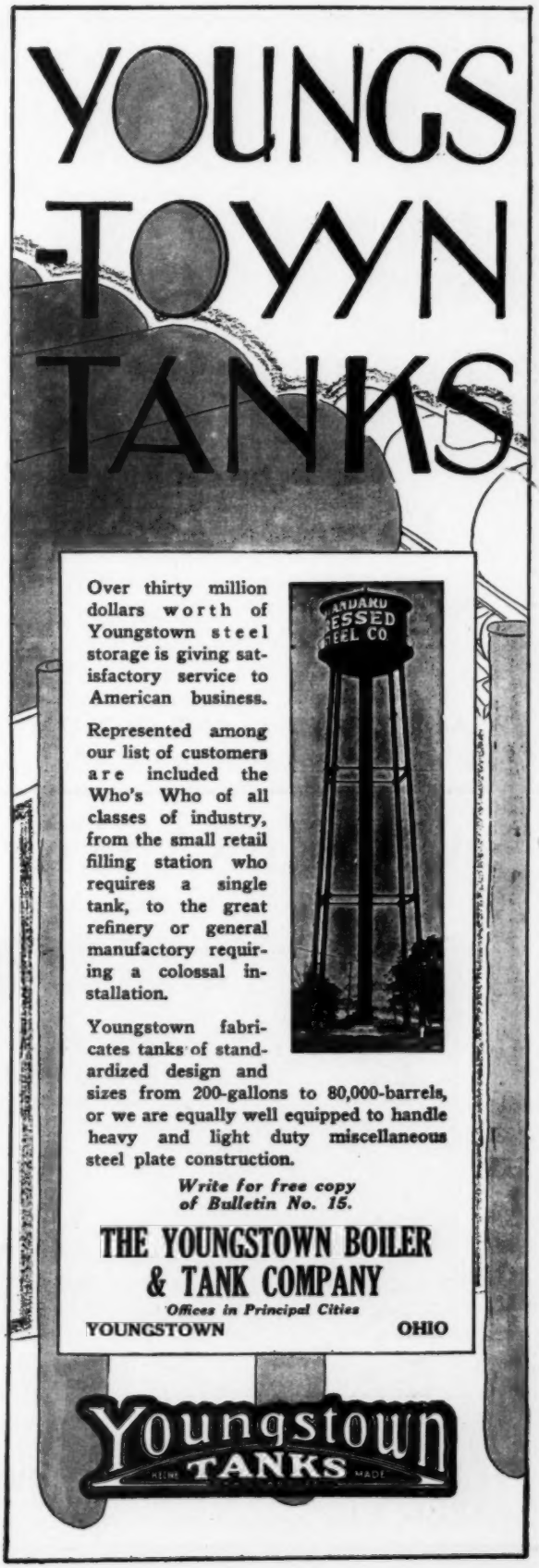
Reports showed that 1928 has been an exceptionally good one with the company. The new machine, just installed, is a heavy producer. The company has been able to work out for regular production some highly interesting specialties.

Allied Paper Mills held its annual meeting January 24. Officers and directors, were re-elected as follows: Directors: Mrs. Florence G. Anderson, A. L. Pratt, George D. Cobb, A. B. Connable, G. S. Davis, J. H. Dewing, A. E. Kettle, W. E. Kidder, S. B. Monroe, Frank Mosteller, J. A. Pyl, A. G. Gilman, and H. L. VanderHorst. President and general sales manager, Alex G. Gilman; vice president and general manager, Frank Mosteller; vice president, John A. Pyl; secretary, G. S. Davis; treasurer, S. B. Monroe.

At the annual meeting of the MacSimBar Paper Company, held Jan. 24 in Otsego, all officers and directors were re-elected as follows: President, C. E. Nelson; vice president, S. W. Simpson; secretary-treasurer, George D. Cobb. Directors, George D. Cobb, S. B. Monroe, W. E. Kidder, Florence G. Anderson, C. E. Nelson, S. W. Simpson, Fred C. Hall, E. W. Stone, John Vanderveen.

At the annual meeting of the Western Board and Paper Company held Thursday January 11th, the following directors were named: C. H. Kleinstuck, B. C. Cidkinson, S. B. Monroe, Michael Redmond, C. G. Bard, and C. E. Nelson. C. G. Bard, was advanced from the vice-presidency to succeed A. E. Curtenius as president, S. B. Monroe was named vice president, Mitchael Redmond, treasurer, and James P. Bachelder, secretary.

The Consolidated Paper Company, Monroe, Mich. showed a net profit of $920,977.52 for 1928, after all deductions. This is equivalent after the payment of 7 per cent preferred dividends of $145,626.85, to $1.03 on each share of the 750,000 shares of common stock outstanding. Common dividends on the basis of nine per cent were paid during 1928.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TANKS
Over thirty million dollars worth of Youngstown steel storage is giving satisfactory service to American business.
Represented among our list of customers are included the Who's Who of all classes of industry, from the small retail filling station who requires a single tank, to the great refinery or general manufactory requiring a colossal installation.
Youngstown fabricates tanks of standardized design and sizes from 200-gallons to 80,000-barrels, or we are equally well equipped to handle heavy and light duty miscellaneous steel plate construction.
Write for free copy of Bulletin No. 15.
THE YOUNGSTOWN BOILER & TANK COMPANY
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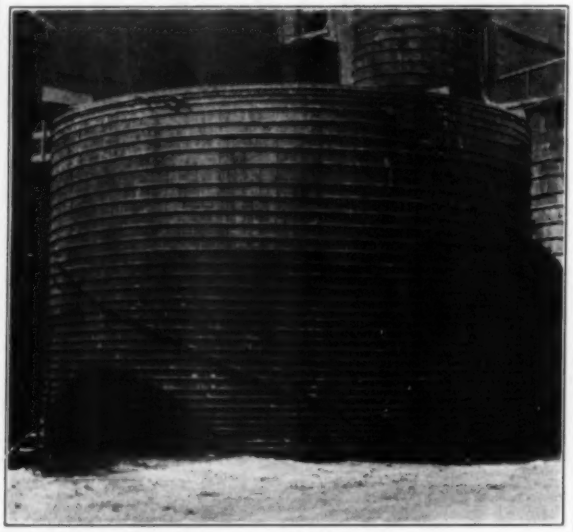
TANKS

WOOD TANKS TILE



Blow Pit and Vomit Stack at Marathon Paper Company Mill.

NO TANK is too large and none too small for our tank-making equipment and stocks. We cater to the needs of the paper industry. Blow Pits, Vomit Stacks, Stock Tanks, Acid Storage Tanks, Stuff Chests, Agitators, etc. See our Condensed Catalog in Paper and Pulp Mill Catalog. Ask us about our Glazed Tile Tanks.

Tank Builders Since 1867

KALAMAZOO TANK AND SILO CO.
KALAMAZOO, MICHIGAN

Clean Pipe Lines All of the Time

Slimy pipe lines mean dirty paper and consequently —waste.

It is easy to avoid this trouble with the Hayton Go-Devil. This instrument cleans pipe lines mechanically with no trouble and in a short time. Just insert the Go-Devil in the pipe, turn on the fresh water and out the other end comes all of the slime.

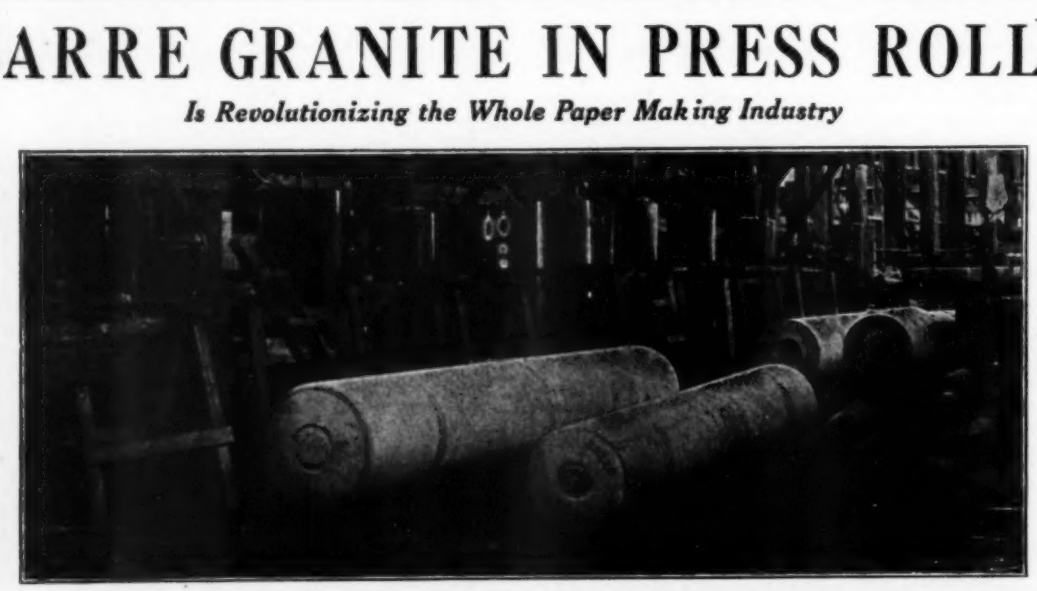
The propeller-like blades of the Go-Devil revolve against the pipe walls scraping off the fungus, leaving a clean line. By means of a strong flexible spring the bends are negotiated with ease.

We will gladly furnish any further information you may desire

HAYTON PUMP AND BLOWER CO.
Appleton, Wisconsin

'BARRE GRANITE IN PRESS ROLLS

Is Revolutionizing the Whole Paper Making Industry



If your Paper Machines are not equipped with Press Rolls of BARRE GRANITE you are not getting the results that you should get, for it is a recognized fact that granite rolls are much superior to any others and Barre Granite the best of all. Let us tell you about them.

Jones Brothers Company
BARRE, VT. BOSTON, MASS.

President E. C. Rauch reports that plant additions and improvements during the last year resulted in an expenditure of $594,294. Warehouses that will carry 10,000 tons of paper stock are planned for the immediate future. As of December, 1928, current assets were $3,010,023 and current liabilities, $896,794; gross assets were $12,044,439. Patents and good will are carried at $1.

Rex Paper Company stockholders held their annual meeting January 22. The last year has been a good one. The property is in fine condition and is being maintained at a high state of efficiency. All officers and directors were re-elected as follows: president, Merrill B. King; vice president, H. H. Creamer; secretary, Harry C. Bradford; treasurer, R. B. McCulfor; the Board of Directors is composed of the officers, W. J. Lawrence, Ellen R. King and William Irwin.

Stockholders of the Sutherland Paper Company have received temporary certificates issued as result of the recent declaration of a 20 per cent stock dividend, payable to holders of the $10 par common stock as of the date of December 20, 1928.

All officers and directors of the Kalamazoo Paper Company were re-elected at the annual meeting, held January 10. Those named are: president, F. M. Hodge; vice president, D. F. Altand; secretary-treasurer, A. E. Curtenius. The officers and W. S. Dewing, C. S. Campbell, A. B. Connable, D. R. Curtenius, and C. H. Kleinstuck comprise the board of directors.

Consolidated Paper Plans Addition

The Consolidated Paper Company, Monroe, Mich., has plans for a new paper stock building of brick and steel construction, which it is estimated will cost about $200,000.

The new building will be of steel and sheet metal construction, 120 x 580 feet. The equipment will consist of electrically operated cranes for storage, electrical trucks for unloading and electrically operated conveyors for sorting operations and for conveying the paper stock to the beaters. This building will be erected on property adjoining the company's plants Nos. 5, 6, 7, 8 and 9. Construction will begin about April 1, and it is hoped the building will be finished by July 1.

C. C. Kennedy, for 20 years vice president and production manager of the Sefton Manufacturing Co., Chicago, has been made production manager in the carton division of the Sutherland Paper Co., Kalamazoo, Mich., to succeed J. F. Byrne who resigned the first of the year to become associated with the Wolverine Carton Co., Grand Rapids, Mich.

Winship A. Hodge, has resigned as general manager of the Western Board and Paper Company, Kalamazoo, to become connected with the Kalamazoo Business College. Mr. Hodge is succeeded by Clarence Sisson, who for the past five years has been assistant manager and treasurer of the New Haven Pulp and Board Co., New Haven, Conn. Mr. Sisson, however, is well-known in the Kalamazoo valley, having formerly been with the Eddy Paper Corp.

P. Durand, secrtary of the Port Huron Sulphite and Paper Co., and a resident of Port Huron for 20 years, died unexpectedly January 2. He is survived by his widow, a son, and daughter.

A comprehensive display of cornstalk pulp and paper is being shown in the lobby of the Kalamazoo Trust and Savings Bank. Pulp is shown in the dry state, also when ready for the paper machine. The paper is shown in finished and unfinished conditions.

Appeal to the Supreme Court has been made in the case of the Story Parchment Company, Trenton, Mich., vs. the Kalamazoo Vegetable Parchment Co. and the Paterson

DON'T LET PROFITS MELT!

THE largest single item in the cost of your paper is the fourdrinier machine.

Why be satisfied with less than the maximum of profit from its operation?

Improved fourdrinier operation means more and better paper with the same power, labor and overhead! Time lost in fourdrinier production is time, paper and profit lost forever!

Tyler Fourdrinier Wires will help you to get the maximum of profit from your fourdrinier machines. They have an earned reputation for long wear, continuous service, and for making high grade flawless paper.

Tyler Wires are an investment in increased paper production—in decreased paper costs.

Supplied in all widths up to and including 234 inches

The W. S. TYLER COMPANY
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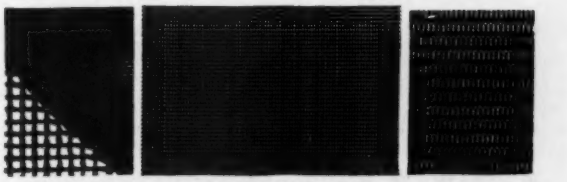
TYLER WIRES



Backing Wire Tyler Fourdrinier Wire Corduroy Cloth

"An Ounce of Prevention"—

Fig. 120

EACH Powell Valve built with "an ounce of prevention" to insure dependable service. Each part ruggedly constructed from virgin metals—each part accurately processed—each assembled unit individually tested.

Powell Products include bronze, iron and steel valves; oilers, lubricators, grease cups, water and oil gauges, etc.

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1 *Efficiency measures power economy*

Efficiency and dependability must be considered when figuring lowest cost power drive equipment, for no equipment is better than the service it gives.

PRODUCTS
Fluid Lubricated Bearings
High Speed Water Cooled Bearings
Clutches
Flexible Couplings
Tubular Adjusters
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and Transmitting Equipment

Hill Clutch power equipment for all industries is designed and built on the most advanced engineering principles, proven by practical tests to provide the most economical and efficient distribution of power in every phase.

Hill Clutch offers an engineering service to Industry, whereby a separate study of your needs is made and the most efficient equipment possible for your particular purpose is recommended. Before making any proposed change, replacement, expansion or new installation of power equipment in your plant, get the benefit of Hill Clutch experience. A request will bring our representative.

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POWER TRANSMITTING ENGINEERS

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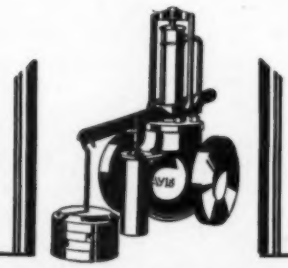

ENGINEERED FOR RESULTS

Accurate pressure control is engineered into the Davis Pressure Regulator. A balanced disc, unaffected by high pressure fluctuations, automatically throttles the flow. A steady, constant service pressure of any amount is had by simply balancing the pressure by counterweights. A simple design assures efficient results.

G. M. DAVIS REGULATOR CO.
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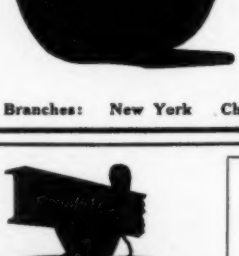
DAVIS AUTOMATIC VALVE SPECIALTIES

PI-2-Gray

Quaker Belts give fine results



For the punishing drives of paper mill beaters and pumps, Quaker Rubber Belts give unusual service. Their rugged ply construction gives strength to deliver power without shirking. The tough rubber compound makes Quaker Belts impervious to deterioration from heat and moisture.

Try a Quaker Belt on a beater

QUAKER CITY RUBBER CO.
Manufacturers of mechanical rubber goods
WISSINOMING, PHILADELPHIA

Branches: New York Chicago Pittsburgh San Francisco

Lift Electrically

Why pull, tug, strain and waste your time with slow lifting methods, when the ROEPER TYPE "R" Electric Hoist will do the work twenty times as fast. The price is surprisingly low. Send for Bulletin.

Roeper Crane & Hoist Works, Inc.
1724 N. 10th St., Reading, Pa.
Member of Electric Hoist Manufacturers Association

Vegetable Parchment Company, Paterson, N. J. The case brought in a Boston court, charged unfair price-cutting, suit being filed under the provisions of the Sherman Anti-Trust law. A verdict of $65,000 was returned against the defendants.

Henry H. Backmann, an employee of the Standard division of the Sutherland Paper Company, died suddenly January 13.

Michigan Division Supts.

The January meeting of the Michigan Division of the American Pulp and Paper Mill Superintendents Ass'n. was held January 17 at the Park American hotel. R. A. Hayward, general manager of the Kalamazoo Vegetable Parchment Co., was the speaker of the evening. The meeting was preceded by the usual dinner.

The February meeting will be held at the Park-American hotel, Kalamazoo February 21.

R. N. Watts of the Cheney Bigelow Wire Works, Springfield, Mass., will be the speaker of the evening and his subject will be "Fourdrinier Wires in the Making". His talk will be illustrated with pictures showing the making of wires from beginning to the finished wire. A large attendance is expected.

PACIFIC COAST NEWS

WASHINGTON

Tumwater to Resume Operations

Announcement was made early in January that the Tumwater Paper mills would resume operations on full time about the seventeenth of the month, following a closedown of six months. It is understood that the officers and personnel of the mill have been reorganized and that a refinancing program has been successfully carried out.

T. J. Lamoureux, for the past year superintendent of the Oregon Pulp and Paper Mill at Salem, Oregon, is also a director in the concern and will act as secretary-treasurer. He accompanied Mr. Giles to Olympia to assist in making arrangements for the reopening. About 80 men are to be employed in the mill which will be operated 24 hours a day, each man working an eight hour shift. The capacity of the plant is 35 tons a day.

Coast Mills Send Resolution to Tappi

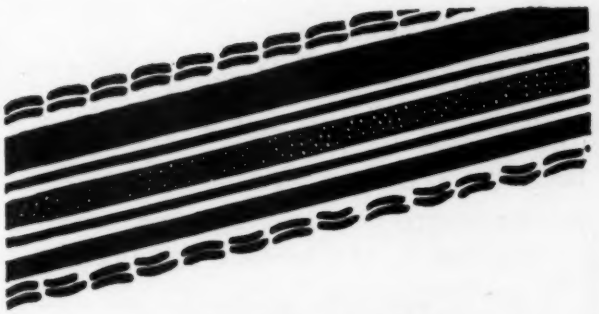
The following resolution was drawn up by delegates from Pacific Coast pulp and paper mills who met at the New Washington Hotel in Seattle on January 12:

"Resolved, that with adoption of the following amendment to the by-laws of Tappi that a Pacific Coast branch of Tappi would best meet the needs of the industry, and that Tappi be immediately approached to ascertain the opinion of its western members, and, if favorable, to form a branch."

The following is the amendment referred to in the resolution: "Any person working in the pulp and paper or associated industries who has insufficient qualifications for associate or full membership may become a junior member and must apply for an associate membership as soon as his qualifications permit."

The above resolution is the outgrowth of efforts for the past few months on the part of a number of representatives of the industry to form a Pacific Coast branch of Tappi. Efforts are being made to hold the next fall meeting of the Tappi in a Pacific Coast city and it is generally believed that at the annual meeting in New York February 18-21, such an invitation will be extended a Coast city. With the formation of a Pacific Coast branch, which will hold a yearly meeting in addition to the National meetings, it is believed the needs of the industry will be much more readily met than they have been in the past.

A copy of the resolution was promptly sent to R. G. Mac-



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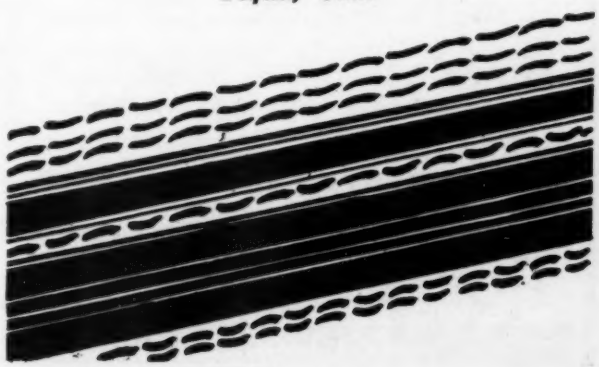
Felts

A complete line including endless felts up to 86 feet in length. Unusual ability to remove water and do it fast. Several extra days service before being discarded as proven by recent comparative mill tests.

Describe your felting conditions and we will supply the felt to meet them.

Send that next order to Orr.

The ORR FELT & BLANKET CO.
Piqua, Ohio



PAPERMILL MACHINERY FOR SALE

72" Trim Complete Board Machine, 6 cylinder—6 presses, 61 dryers 36" diam.; drives, pumps, variable speed engine, blower, etc.
Good Parts of 80" Trim Paper Machine—except Wet End and presses—14 dryers 48" diam., calenders, reel, Moore & White slitter and winder.
Beloit Triplex Pump 11" x 10".
Gould Triplex Pump 8" x 12".
Noble & Wood, Emerson, and Horne Jordans, of various capacity.
Two 60" Hamblet sheeters with Moore & White Layboys, six roll back stands.
Seybold Paper Cutters—65" and 74".
Cameron Langston and Kidder slitters—different widths.

Send us your inquiries.

GIBBS-BROWER COMPANY, Inc.
Paper and Pulp Mill Brokers
261 Broadway, New York City
OUR MOTTO—"Service First"

BETTER SERVICE
on

Hard maple and gum wood press rolls
Brass tube rolls
Bronze couch and breast rolls
Brass, Iron and Wood felt rolls
Copper covered felt rolls
Brass covered felt rolls
White wood felt rolls
Iron cores for rubber covered press and felt rolls
Bronze suction box covers
Hercules car movers

All rolls balanced

We would be very glad to submit information and quotations on all products. Just drop us a card.

J. W. Hewitt Machine Company
Paper Mill Machinery
Neenah Wisconsin

Paper Mill Machinery

1—Rice Barton & Fales Fourdrinier with two presses 24 dryers 48x94", two calenders
1—Fourdrinier with two presses, 19 dryers, 36x84"
1— 84" Clark Cutter with Moore & White Layboy
2— 90" Holyoke Super Calenders motor drive
1— 72" Holyoke Super Calender motor drive
3— 66" Holyoke Super Calenders belt drive
1—154" Warren two drum winder with slitter
1—149" Beloit two drum winder with slitter
1—130" Moore & White four drum winder with slitter
1—129" Pusey & Jones two drum winder with slitter
1—127" Warren two drum winder with slitter
1—112" Moore & White four drum winder with slitter
1— 84" Beloit two drum winder with slitter
1— 60" Kidder two drum winder with slitter
1— 77", 60", 52" Hamblet Sheet Cutters.
1— 70", 56", 54" Moore & White Sheet Cutters
1— 14x16" Ball Twin Variable Speed Engine

FRANK H. DAVIS COMPANY
175 Richdale Ave. CAMBRIDGE, MASS.

EXPERIENCED SULPHITE SUPERINTENDENT—desires new connections. At present employed as such in large paper mill. College graduate. Can cook best quality sulphite. Address Box 148, The Paper Industry.

MASTER MECHANIC WANTED—About 35 or 40 years of age. Thorough machinist, with experience in paper mill machinery. Knowledge of A. C. motor drives and general transmission equipment, with ability to handle men in all lines of construction and repair work. Only A-1 men need apply. Work in the vicinity of Wilmington. Give full detail of experience and salary expected. Address Box 149, The Paper Industry.

USED JORDANS—7-Large Jordans, some belt drive and some direct connected to motors, including motors and starters, all in good condition and at extremely low prices. If interested, write us quickly, describing your requirements. The Noble & Wood Machine Co., Hoosick Falls, N. Y.

FOR SALE—One slightly used Noble & Wood Mammoth Jordan together with 500 HP motor and coupling. It is also equipped with pulley for belt drive, if preferred. Price and particulars upon request. The Noble & Wood Machine Co., Hoosick Falls, N. Y.

It Pays to Advertise Opportunities in this Opportunity Section

STEEL PLATE CONSTRUCTION
Riveted and Welded
Specialists in PAPER DIGESTERS and Heavy Plate Work
RITER-CONLEY COMPANY
Pittsburgh, Pa.

THE JOHNSON FRICTION CLUTCH
For Corrugating Machines
Write for Catalog, P.I.
THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN

Donald, secretary and treasurer of the national association of Tappi.

The meeting which was called together by Prof. H. K. Benson of the University of Washington, was attended by the following representatives of the industry on the Pacific Coast:

E. P. Brennan of the British Columbia Pulp and Paper Co. Ltd., Woodfibre, B. C.; F. C. Brewer, Shaffer Box Co., Tacoma, Wash.; Myron Black, Inland Empire Paper Co., Millwood, Wash.; Robert Bundy, Fibrewood Products Co., Port Angeles, Wash.; Robert Bell-Irving, Powell River Company, Ltd., Powell River, B. C.; Wm. Breitenbach, Rainier Pulp and Paper Co., Shelton, Washington; C. B. Everitt, Fidalgo Pulp Mfg. Co., Anacortes, Wash.; E. Eckholm, San Juan Pulp Mfg. Co., Bellingham, Wash.; B. T. McBain, pulp and paper mill specialist, Portland; and, Robert Scanlon, Powell River Co., Ltd., Powell River, B. C.

Rainier Declares Dividend

Directors of the Rainier Pulp and Paper Co., Shelton, Wash., have placed the class A common on a $2 annual dividend basis by declaring a dividend of 50 cents, payable March 1 to stockholders of record February 18. Class B common stock has been placed on a regular $1 annual dividend basis with a regular dividend of 25 cents and an extra dividend of 25 cents per share on class B common stock having been declared payable on the first of March. The class A common stock is entitled to preferential dividends of $2 per annum. After $2 is paid on the Class B in any one year, then both classes share alike in any further dividend disbursements.

A new steam unit is being installed in the plant of the Rainier Pulp and Paper Company at Shelton, Washington and will be completed about the first of April. According to Blyth and Company of Portland, Oregon a number of other additions to the plant are being contemplated which will serve to increase its production materially. It was announced that the Ranier Pulp and Paper Co., in the month of January, exceeded all previous tonnage records despite adverse weather conditions. Logging operations were temporarily closed down owing to heavy snowfall.

Crown-Zellerbach Buys Large Timber Holdings

Timber holdings in the Cape Flattery district in Washington have just been purchased by the Crown-Zellerbach corporation to the amount of 800,000,000 feet of standing timber, bringing the total holdings of the corporation and subsidiaries in the United States and Canada to more than 10,000,000,000 feet. These new holdings have been acquired as a reserve for paper mill operations at Port Townsend and Port Angeles.

It is said that the corporation now has a reserve sufficient with natural timber growth and artificial reforestation for almost perpetual operation of its mills. The corporation has practiced a policy of reforestation by replanting each year sufficient young trees to more than replace the timber cut. Two nurseries are operated in conjunction with the reforestation program, one in Oregon for the Columbia River reserves and one on the Olympic peninsula for the Puget Sound territory. As a further reserve to its timber holdings, the corporation has had engineers and cruisers in the Tongas national forest in southeastern Alaska selecting timber holdings to be operated under government contract in the event of manufacturing expansion.

It is expected that construction on the 100 ton sulphate pulp mill for the Willapa Pulp and Paper Co., at South Bend, Wash., will begin about February 1. This plant will produce about 25,000 tons of pulp annually. Sale of the product and

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"The Old Army Game," recently published in "BLACK AND WHITE," is a typical example of the kind of editorial to which we refer. This startling exposure of the use of high-sounding, meaningless pseudo-scientific jargon in the marketing of motor oils is typical of the type of editorials appearing in Houghton's "BLACK AND WHITE."

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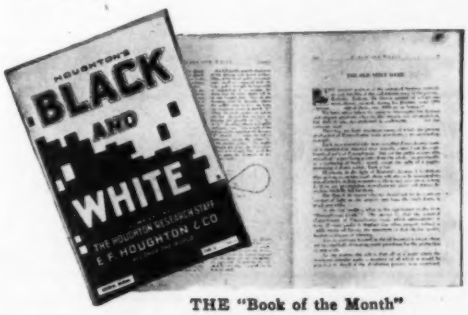

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financing are said to be virtually completed. R. A. Swain is president of the company.

L. E. Van Winkle, secretary of the Pacific States Pulp and Paper Company, Aberdeen, announced on January 27 that his company's construction of a plant at Priest River, Idaho, would not retard development at Aberdeen where another mill will be built. A site for a million dollar pulp mill has been obtained at Priest River. First unit of the mill will be a sulphate and kraft plant which will manufacture thirty tons of the finished product daily and the second unit will be a thirty ton strawboard mill.

The Zellerbach Paper Company has taken options for a site for a $5,000,000 paper mill at Bellingham, Wash., according to reports from that city.

Announcement was made on January 9 by officers of the Pacific States Pulp and Paper Company of Aberdeen, Washington, of plans to construct a $1,000,000 pulp mill at Priest River, Idaho. This mill will employ about 300 men.

OREGON

The Fir-Tex Insulating Board Company of Portland, Oregon on January 10 announced that it has increased its $2,500,000 common stock and 25,000 class B no par value to 25,000 Class A $100 shares and 35,000 class B no par value.

While on a recent visit to Portland, Oregon, George Alexander Parks, governor of Alaska, en route to Washington, D. C. stated in regard to the prospects for the development of pulp and paper that engineers of the Zellerbach and Cammeron interests worked in Alaska all summer, surveying timber and water power. Two tracts have been leased—one near Ketchikan and the other near Juneau. According to the contracts made with the Government for this timber, operations must start within a year or so. It is a step forward.

CALIFORNIA

The Waterproof Paper Company is the name of a concern that is opening a new factory at Southgate, Calif., with Mrs. F. L. Kennedy, president, Fred F. Kennedy, treasurer and manager and C. C. Marshall, secretary. The building is 35 x 110 feet on a 120 x 150 foot plot of ground and together with equipment represents an investment of $25,000. This concern will devote its efforts to the manufacture of oiled and waxed papers, oiled stencil boards and a cellophane substitute.

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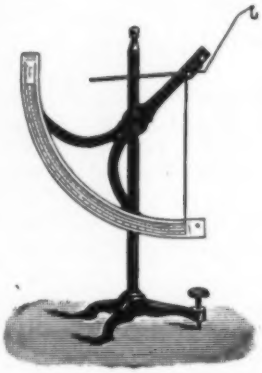

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Technical Developments in the Paper Industry

Domestic and Foreign

The following abstracts are of the latest developments found in the foreign press and the domestic and foreign patent offices. Photostats and translations of complete articles and patents can be obtained at cost price.

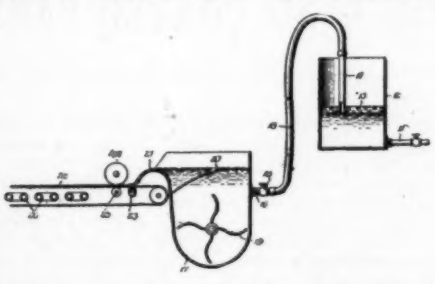
Bleaching Sulphite Pulp in High Concentration in Water Mixture

THE determinative conditions applying to the bleaching of paper pulp in a mixture with water containing a high concentration of the pulp are described and the advantages of the process are outlined. This is particularly the case where the process is used as a preliminary bleach. The time of bleaching, the speed of reaction, the chlorination and the concentration of the hydrogen ions follow simple laws when the preliminary bleaching of an easy bleaching sulphite is being carried out. The speed of bleaching is a linear function, which means that it is proportional to the concentration of the bleaching liquor at the start of the process, and hence to the density of the stock.

The speed of reaction is proportional to the square of the concentration of unchanged bleaching agent. The dilution of the active bleaching agent increases in arithmetical progression. The pH decreases in a straight line relation during the bleaching process, in which oxidation is the principal reaction. Variations from these laws occur due to the appearance of by-reactions, such as chlorination. The final chlorination is slightest when the bleaching process is carried out under best conditions and this applies as well to the stock density as to the quantity of chlorine consumed. The bleaching process, especially during the final stage of the process, is dependent upon the speed of diffusion of the soluble incrustations from the interior of the wood fibers into the surrounding liquor. Osmotic processes in combination with the concentration of hydrogen ions are of the greatest importance in the net result of the bleaching process. Hence, the need for well-washing the fibers is significant. E. Hochberger, Papierfabrikant, 1928, pages 66ff.

Improvement in Papermaking Machine

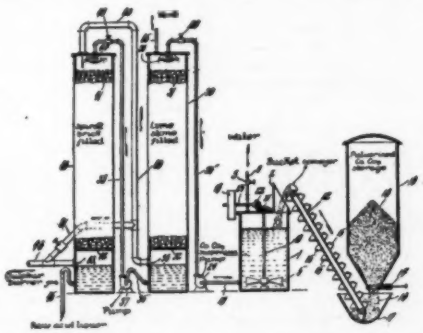
THE improvement consists of a reticulated conveyor, shown at (22) in the accompanying illustration. The conveyor is moved in a convenient manner. A tank (17) is provided at one end of the conveyor and this tank has a marginal curved lip (21) over which the liquid in the tank may overflow on to the conveyor. The tank is also provided



with an agitator (19) which keeps the fibrous materials in suspension in the water. A screen (20) is located between the agitator in the tank and the lip. The tank is fed from the container (12) through the pipe (15) which is controlled by the valve (18). H. R. Williams, Chicago, Ill. United States Patent No. 1,695,873.

Making Calcium Bisulphite Digestion Liquor

THE plant which is employed for making the liquor is shown in diagrammatic form in the accompanying illustration. The pulverized limestone is fed from the storage tower (18) by means of the screw conveyor (12) to the tank (1), in which it is converted into a water suspension by means of the agitating device (10). The suspension of calcium carbonate in water is then pumped by means of the pump (24) through the pipe (25) into the tower (30), which



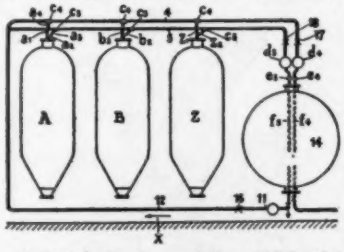
is filled with limestone. In that tower it comes into contact with sulphur dioxide gas which enters at the bottom through the pipe (60). The liquor drops to the bottom of the tower and is removed therefrom by the pump (57) which lifts it to the top of the tower (40) which is filled with spiral brick. There the liquor again comes into contact with sulphur dioxide gas, which enters at the bottom through the pipe (46). G. A. Richter, Berlin, N. H., assignor Brown Co. United States Patent No. 1,694,231.

Increasing Elasticity of Paper

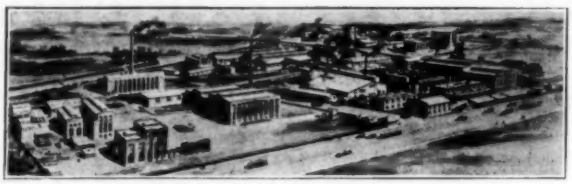
THE elasticity of paper is increased and it is made more ready to shrink by treatment with a concentrated solution of boric acid. The paper is then dried under heat and pressure. D. Genese, United States Patent No. 1,690,631.

Digesting Cellulose

UNITED STATES Patent No. 1,693,983 is concerned with a method of completely and rapidly relieving the pressure in pulp digesters and of regenerating the waste heat and vapors. The digesters (A), (B) and (Z) are interconnected by a system of waste gas pipes, shown running across the top of the digesters. An intermediate connection is made between the waste hose gas pipes and the liquor pipes



in such a manner that an injector is formed by which the hot gases are drawn out of the digesters without cooling them. A pump is provided at (11) for passing fresh liquor under pressure through the injectors. A closed storage tank is provided at (14) from which the liquor is taken by the pump and into which it is fed back after having passed



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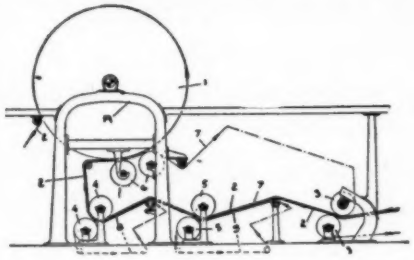
through the injector. C. Hangleiter, Mannheim-Waldhof- and A. Schneider, Kelheim-on-Danube, Germany, assignors, Zellstoffabrik-Waldhof.

Papermaking Machine

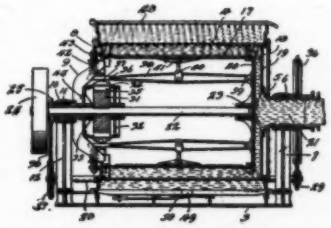
THE improved papermaking machine consists of a single drying cylinder (1) and a couching press (3) as well as a series of intermediate presses between the latter and



the cylinder. These presses have a common upper drying felt (7) and separate under felts. The felt of the intermediate press, adjacent to the couch press, shown at (9) is made of comparatively loose stuff produced by hard twisted yarn, and the felt for the intermediate press adjacent to the drying cylinder, shown at (8), is made of more tightly woven material with a smooth surface. E. A. Oehlin and F. O. Carlsson, Hytlebruk, Sweden, United States Patent No. 1,695,972.

Rotary Screen for Paper Pulp

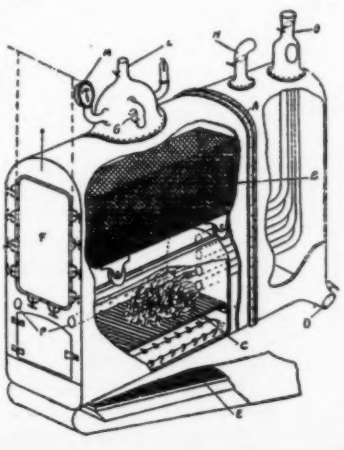
THE screen drum is divided so as to form a series of circumferentially positioned suction chambers. Each of these chambers is provided with a diaphragm which is adapted to be flexed to produce suction in these chambers. Suitable means are provided for operating the diaphragms. E. W. Lindquist, Helsingfors, Finland, United States Patent No. 1,694,622.



Treating Paper Stock with Ozone to Form Pulp

THE new type of digester and digestion process is featured by the treatment of vegetable materials by means of ozone and by the digestion of the stock by means of solutions of the ash obtained by burning the vegetable materials. Various advantages are claimed for this process over those in common use at the present time.

The nature of the apparatus used is seen in the accompanying illustration. The raw material is placed within a small wagon (B) which runs on rails. A fire box is provided with fire tubes (C) and a special grate for collecting the ash from the burnt wood. The position of the fire box is such that efficient use is made of all the heat evolved. A scraper is arranged within the fire box so that the ash which is formed is continuously removed and fed into the sifter (E) arranged underneath the digester. The residual liquors from the digester are removed through the outlet (D) and fed into tanks from which they are removed to the evaporator and thence the fire box for the purpose of recovering potash values and burning the organic matter contained in them. The residual liquors are injected into the apparatus through the injectors (P), the water being converted into steam and the solid matter being burnt and finally converted into ash. The potash is thus recovered.



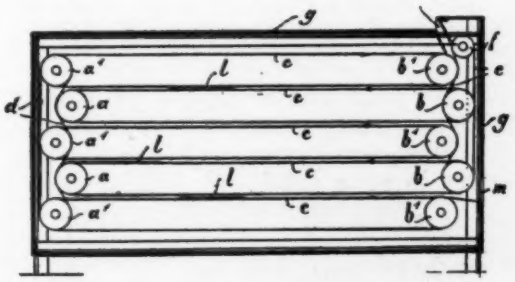
The material to be digested is placed within the wagon and moved into the apparatus. The door is hermetically shut and the chamber, in which (B) is located, is filled with water. After an hour's maceration, the water is removed and ozonized air under a pressure of three to four atmospheres is introduced into the apparatus and allowed to act upon the vegetable matter for about two hours. The ozone oxidizes and removes the incrustating and resinous matters in the wood. After the ozonized air has been removed, the chamber is filled with potash liquor of a concentration suitable to the cellulosic matter being digested. A fire is kindled in the fire box and enough heat is generated so that a pressure of three to eight kilograms is obtained within the digester proper. After digestion is completed, the pressure is relieved. The pulp obtained is slightly brownish in color or if a bleaching agent is added to the digester, after digestion proper has been completed, a white pulp is obtained. G. A. Mourlaque, French Patent No. 639,900.

Determination of Rosin in Rosin Size

THE Kogan method for the determination of rosin in milk of rosin is described. This method consists in precipitating the rosin from the rosin milk by the addition of acid and melting the precipitate to agglomerate into a ball by heating the mixture. This ball of rosin is recovered from the solution, dried between filter paper and then weighed. It is reported that this method is not sufficiently accurate, and the following method is advised as being more accurate.

Twenty-five cc. of the milk of rosin are precipitated with twenty-five cc. of tenth normal sulphuric acid solution. The precipitated rosin is filtered through glass wool and the unconsumed acid is titrated back in the filtrate. The number of cubic centimeters of sulphuric acid solution used are multiplied by the molecular weight of the rosin (0.0302) and by the factor 40, in order to obtain the content per liter of the milk of rosin. The obtained figure must then be multiplied by a factor, which indicates the ratio of the total rosin to the combined rosin, which must be established now and then for the milk of rosin. This method was tested and a great many tests were made on it. The results obtained agreed very well. Schichirew, Bumaschnaja Promischlennost, volume 7, pages 562ff.

Guiding Arrangement for Drying Paper in Sheet Form

THE guiding arrangement or installation consists of two groups of rollers which are arranged opposite each other. For example, five of these are arranged one above the other

and opposite each other, as shown in the figure at (a), (a'), etc. and (b), (b'), etc. Over each two opposite roller, such as (a) and (b) a carrying belt (C) is run. The guide rollers, which are located at one side at (a) and (a') carry a vertical belt (d) which runs at right angles to the belt (c). The belt (d) is arranged in such a manner that it runs over the outer-positioned roller (a') and tends to press this roller against the inner-located roller (a). Inasmuch as the roll-

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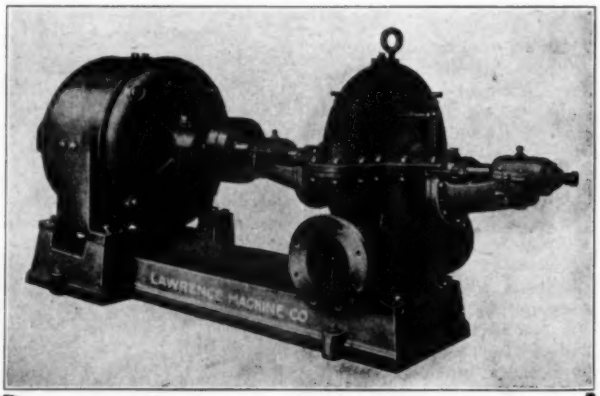

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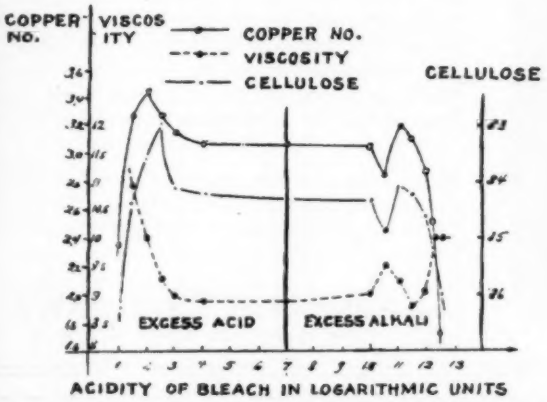
ers (a) and (a') partly overlap each other, the belt (d) has a curved path in passing over these rollers. The reverse is true on the other side of the apparatus. Here, an auxiliary roller (f), which is located above the outer-positioned roller (b) is provided in order to aid in the transporting of the sheets of paper. The vertical belt (e) runs over the rollers (f) and (b) and is pressed against the rollers (b'). Paper in sheet form is entered into the apparatus through a slot (k) in the cover of the apparatus or in some other suitable manner. The paper is seized by the belt (e) and carried over to the carrying felt (c) of the next roller in series. The paper (l) is thus made to pass from one felt (c) to the other in series through the apparatus. E. A. Albrecht, German Patent No. 466,786.

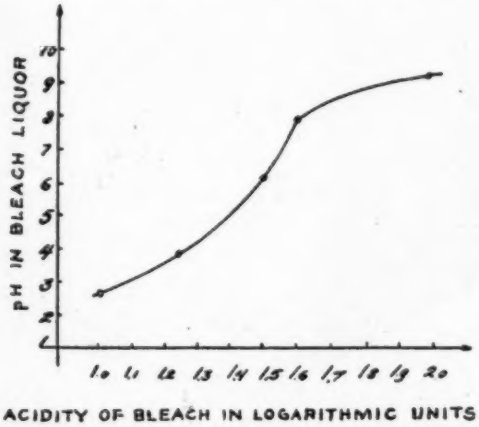
Bleaching Sulphite Pulp

INVESTIGATIONS were made on exceptionally easy-bleaching pulp and indicated that an acid bleaching process consumes hydrogen ions, while an alkaline process sets hydrogen ions free. By adjusting the initial status of the



Relation between acidity of bleach and copper number, viscosity and cellulose content of pulp

process, equilibrium can be established between the two phenomena, so that the alkalinity at the beginning and at the end of the bleaching process is the same. Theoretical

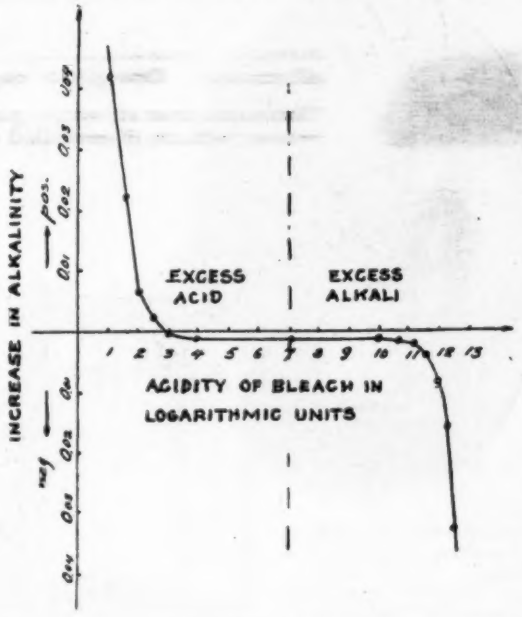


Relation between pH value and HCl concentration over neutral considered chloride of lime in 0.1106 normal solution

review of the work carried out indicates the result that free chlorine cannot exert any bleaching action upon sulphite pulp and that the hypochlorite ions are the most active bleaching agents. The bleaching capacity of hypochlorous acid is found to be considerably less potent than that of the hypochlorite ion.

Bleaching experiments were made on a type of sulphite pulp which required twenty per cent chloride of lime. A new method for measuring the pH value is described. This method is applied to the determination of the hydrogen ion concentration in the bleach liquor.

The stock used was tested by mixing it with twenty-five per cent chloride of lime and allowing this to act upon the



Relation between original acidity of bleach liquor and increase of alkalinity during bleaching

pulp for four hours at a temperature of 35 degrees C. and establishing the amount of chlorine of lime left. It was found the pulp consumed 20.2 per cent of chloride of lime. A number of samples, 35 grams each, were weighed out from the mass of pulp containing six per cent water. The tests were made in beakers and in each case a total volume of 525 cc. of liquid was used. In order to avoid under-bleaching and abnormal phenomena brought about by this condition, eighteen per cent of chloride of lime was added. The chlorine solution used was prepared to contain one per cent of active chlorine. 206 cc. of chloride of lime solution were used in each test.

The solutions were tested for excess alkali in the usual manner and a definite quantity of the solution was mixed with hydrogen peroxide until evolution of chlorine ceases as tested by means of starch-iodide paper. Then the solution was titrated with tenth normal hydrochloric acid. The alkalinity of the solution in terms of sodium hydroxide was 0.239 gram per liter. 206 cc. of the solution corresponded to 12.36 cc. of tenth normal NaOH.

The purpose of the bleaching tests was to determine the influence of the concentration of hydrogen ions on the process, in order to obtain therefrom a more general conception of the nature of the progress of the reaction. What varied from case to case was the original content of the resulting bleach liquor in acid or alkali over the neutral considered chloride of lime. Various proportions of hydrochloric acid or sodium hydroxide were accordingly added to the solution.

A temperature of 28 degrees C. was maintained during the bleaching tests. This temperature was maintained during the entire process until all of the chlorine had been consumed. The solution was agitated once or twice hourly.

It was found that the results obtained on difficultly and easily bleached stock agree fundamentally with one another, hence, it can be assumed that the hypochlorite ion is by far and large the active ingredient of the sulphite cellulose bleach liquor. Inasmuch as the oxidizing action is considered to be the one that is mostly wished for, the action of the hypochlorite ion can be explained according to the fol-

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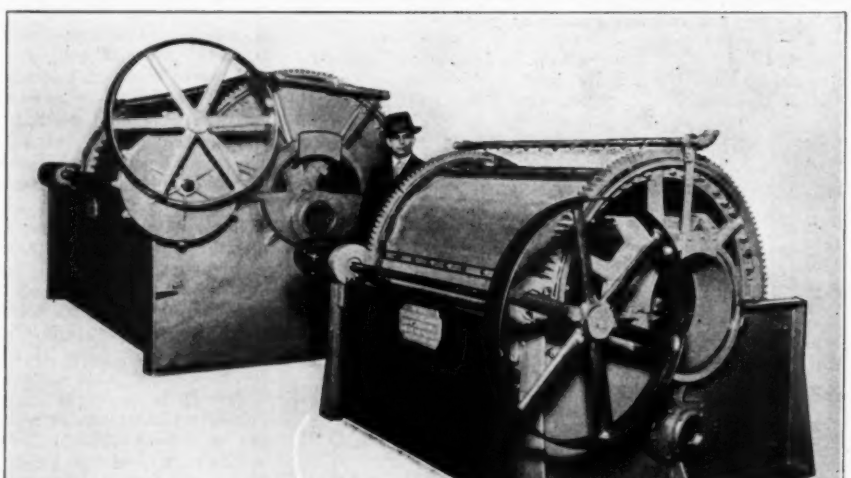


LOW INLET — CENTER INLET

GREEN BAY FOUNDRY & MACHINE WORKS

Green Bay, Wis., U. S. A.

lowing reaction equation:—C10 = C1 + 0 (in nascent state). Hypochlorous acid also decomposes with the release of active oxygen, and hence the speed of reaction is much greater than for the hypochlorite ion. Hypochlorous acid therefore plays just as important a role as the hypochlorite ion in the bleaching process. The fact that this is actually not true must be explained in that the solubility of the oxidation products formed must become greater when the pH value of the solution rises. Thus it is apparently found that a part of the carboxylic acids formed are not so soluble as their salts. A more favorable bleaching effect is attained at a relatively high alkalinity, a fact which is connected with a more complete neutralization of the carboxylic acids.

It is incorrect to call chlorine the active bleaching agent in the process. The results given in this article show why this is so. R. Bergqvist, Der Papierfabrikant, contribution from the Society of Pulp and Paper Chemists and Engineers, 1928, pages 593-604.

Measuring External Temperature of Drying Cylinders

NOT sufficient importance has been placed upon the maintenance of the proper temperature at the surface of the drying cylinders. It is generally known how much steam is fed to the drying end of the paper machine, but it is still yet to be established what definite surface temperature is best suited for a particular kind of paper that is being dried.

An instrument for measuring the temperature of drying cylinder moving rolls, pressure plates and heated bodies of

all sorts is seen in the accompanying illustration. It is a thermo-electric pyrometer. The principle of the instrument is the generation of the so-called thermo-current by heating the point of union of two dissimilar metals. The strength of the current generated is a measure of the temperature of the heated body. The thermo-electric element may be seen in the illustration in contact with the roller. It is a metallic strip approximately 0.1 mm. thick and five mm. wide. It is held in a stretched position as shown. The junction point of the two dissimilar metals lies at the midpoint of the strip. The effect of the temperature of the heated body upon the thermo-electric element is translated into degrees of temperature on a graduated measuring scale. It is claimed that the measurement of temperature with this device is accurate within one to two degree C. approximately. Temperatures up to 150 degrees C. can be measured with the aid of this instrument. Zellstoff und Papier, 1928, page 662.

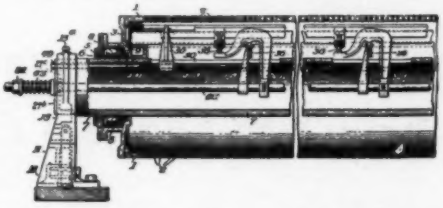
Paper Insulators

HARD paper, which is a most useful electrical insulator, possesses the capacity of absorbing water and for this reason its use is limited to internal insulation. Tests have been made to improve the paper so that it can also be used externally. Thus German Patent No. 395,271 makes the paper resistant to the action of moisture by surrounding it with a ceramic glaze. The glaze is sprayed upon the surface of the paper. An undercoat is first prepared and spread over the paper which forms the binding agent between on the paper on the one hand and the glaze on the other hand.

Cracks are generally formed in baking the insulator and this difficulty is overcome according to German Patent No. 453,412 by filling the cracks with a liquid insulating substance, such as paraffin. Dr. K. M. E. Geisler, Zellstoff und Papier, 1928, page 375.

Suction Roll for Papermaking Machine

A SUCTION chamber is arranged within the suction roll in such a manner that the side walls of this chamber make contact with and extend inwardly from the interior surface



of the roll. These side walls are provided with flexible buckled or bowshaped portions which permit springlike contact between the walls and the roll. This is the feature of United States Patent No. 1,694,698, taken out by E. E. Berry and assigned to Beloit Iron Works, Beloit, Wis.

Determining Transparency of Paper

A RAY of light of average intensity striking vertically upon a sheet of paper is partly reflected, partly absorbed and partly penetrates through. The reflected portion amounts to between 70 and 90 per cent of the incident light, depending upon the quality of the paper. It is dependent upon other factors in addition to the proportion of light absorbed. The author uses different formulae of the oretical optics to determine the absorption capacity of paper. The index of absorption is dependent upon the properties of the paper and on the wave length of light used.

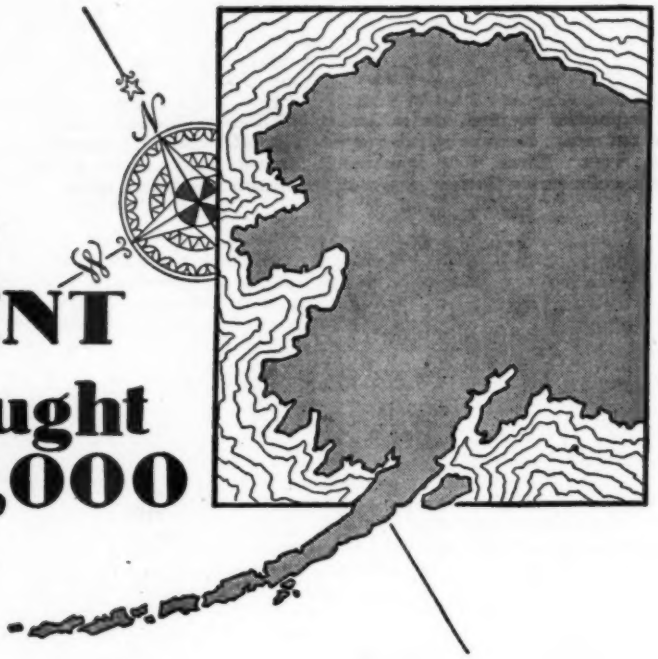
Increasing coefficients of absorption denote higher absorption. The latter is dependent upon the wave length of light in all transparent media. In working with wave lengths which lie within the visible spectrum, it was found in the case of paper containing no color at all that long wave length light penetrates through the paper better than short wave length light, and the index of absorption only remains constant, when consideration is taken of the wave length. However, the absorbing medium shows a spectrum in transmitted light. Paper, which mostly contains some color, possesses the property of selective absorption. Special measurements carried out with monochromatic light of all different wave lengths are therefore necessary in order to obtain a more accurate definition of the absorptive capacity of the paper. Quite large variations are found in comparing the figures which are obtained as an expression of the absorption in monochromatic light of different wave lengths with that of a daylight lamp.

Taking into consideration the numerical values of the coefficient of absorption, the measurements show variations in the various kinds of paper tested between 2.0×10^{-4} and 6.0×10^{-4}. Paper which contains the largest amount of mechanical wood pulp possess the highest coefficient of absorption. Thus we have the following:

Newsprint	6.1×10^{-4}
Paper containing less mechanical wood pulp	5.5 to 6.0×10^{-4}
Paper free from mechanical wood	3.3 to 3.8×10^{-4}
Writing paper free from mechanical wood	2.5 to 4.3×10^{-4}

Papir Journalen, vol. 16, 1928, pages 15ff. written by W. Holwech.

A GREAT CONTINENT that was bought for $7,200,000



ALASKA seems always to have been in the geography. Yet, it was in 1867 that the United States added it to its list of possessions.

Alaska was so called by William H. Seward, this being a corruption of the Aleut word *alak' shak* or *al-ay'-ek-sa*, meaning a great country or continent.

And yet, nine years before Alaska was acquired, Shuler and Benninghofen began the manufacture of Hamilton Felts.

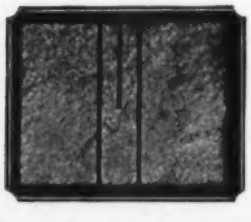
Three generations of experience! Seventy-one years of felt making.

During these years we have learned what to do as well as what not to do. The result is that Hamilton Felts are right. They are made of the proper mixture of wool, and in a way that will give you lower production costs; save you in steam and coal; give you more and better tonnage.

Hamilton Felts on your machines are a positive asset. They last longer with less down time for washings. What is more, they have that hard-to-get combination of great strength with maximum water removing qualities.

As time has proved the wisdom of the purchase of Alaska, so will it show you the wisdom of standardizing on Hamilton Felts.

Try one on the machine that gives you the most trouble. Test it out. Compare it. Put it to any trial you think a felt ought to have. You will soon see that there are felts and there are Hamilton Felts.



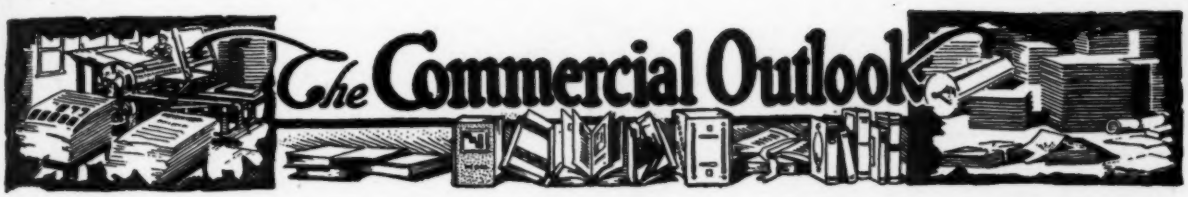
Hamilton Felts are marked by two blue lines full width of the felt and by one shorter blue line midway between them.

Shuler & Benninghofen

Miami Woolen Mills

ESTABLISHED 1858

Hamilton Felts



New York, February 1, 1929

ACTIVITY in the paper industry has revived fairly satisfactorily following the lull during the holiday and inventory period. There is at present a steady development of demand for most classes of paper, and the market situation smacks of normal insofar as the volume of business transpiring is concerned. Consumers and converters are ordering in a consistent manner, and certainly in as large quantities as usually is noted at about this season of the year; there is a gradual expansion of buying which seems likely to carry the market into a livelier position as the spring draws near, and on various sides of the trade one hears expressions of gratification over the amount of business that is being procured.

However, there are sidelights in the market at present which are anything but satisfactory to paper manufacturers and merchants. Reports continue to tell of a good deal of instability in prices of some kinds of paper and board, and it is an open secret that the price situation has degenerated to a degree where some producers of paper are realizing very little profit in their operations. This condition has become so serious in certain directions that it might well be said that it is critical. And yet in other divisions of the trade the situation as regards prices has improved.

Finally a contract price basis has been agreed upon for newsprint over the current year. The new price is $55 per ton f. o. b. paper mills for standard newsprint in rolls, which, while it is a substantial reduction from the prices of $60 to $63 prevailing last year, nevertheless gives the industry a stable basis to figure on and removes the uncertainty that existed for several months. The newsprint price problem harkens back to last October when it was announced by the International Paper Company that that company had made a contract with William Randolph Hearst to supply the latter's newspapers with newsprint over a period of five years at a price understood to be $50 per ton. Following this announcement a series of meetings and conferences between paper manufacturers, and joined in by Premiers Taschereau and Ferguson of Canada, were held in Montreal and New York, and on January 23 it was unofficially announced that a price of $55 had been agreed to for newsprint deliveries during 1929. Before this basis was decided upon it was necessary for the paper manufacturers to obtain the consent of the International Paper Company and Mr. Hearst to readjust the price in their contract to the higher level, which of course required time—and perhaps some persuasion.

The opinion in trade circles is that a price of $55 per ton is going to show many newsprint manufacturers a slight profit at best. It is probable, so it is stated that the large mills in Canada, including those of the International Paper Company, can produce print paper at this market price and eke out a fair remuneration, but the smaller mills and particularly those situated in the United States are likely to have a difficult task making a profit. "It simply means that the newsprint industry is to be driven more into Canada," remarked one authority in the trade, whose viewpoint doubtless is accepted by many other paper men.

There is a most favorable situation prevailing in the board manufacturing industry. As reported previously, board mills in the East, for reasons of their own, late in November cut prices drastically or a matter of $10 per ton on news and chip board from a basis of $40 delivered in New York City for plain chip board to $30 a ton. It was thought at the time that this was a temporary price only and that in the course of several days the low price would be withdrawn, and quotations moved back to the previous levels. But the low price still obtains, and board manufacturers now are sitting with a large volume of orders on file at the low prices which net them virtually no profit, and which unquestionably in numerous cases will necessitate mills suffering a considerable loss in delivering their product. Unless some change for the better in prices occurs — and very soon — it is predicted that board mills will be up against it financially. The situation is believed to be so serious that some leaders within the board manufacturing industry are said to have appealed to the Government authorities in Washington urging that official action be taken to put the board industry back on a profitable and stabilized basis.

Production of paper in the United States during November last, according to identical mill reports to the American Paper and Pulp Association, amounted to 599,102 net tons of all grades, showing a little decline from the 617,391 tons produced in the preceding month but a gain as compared with the 546,946 tons made in September last. The production for the first eleven months of 1928 reached a total of 6,413,225 tons, recording a fair rate of increase over the 6,228,269 tons produced in the corresponding time of 1927, a rise of about 3 per cent. Newsprint, hanging, felts and building paper were the only grades whose eleven month totals were less last year than in 1927. Book, paperboard and tissue production at the end of the eleven months was 6 per cent ahead of the same period in 1927, while bag and writing papers were 4 per cent ahead of the preceding year. Total stocks at mills at the end of November last were about 9 per cent larger than at the same time in 1927. Shipments of paper from mills during November aggregated 591,804 tons, against 620,365 tons in October, and stocks at the end of November totaled 277,426 tons of all grades, contrasted with 272,006 tons on the same date of 1927.

The total production of newsprint paper on the North American Continent in 1928 reached 4,043,780 net tons, of which 2,381,102 tons were manufactured in Canada, 1,414,952 tons in the United States, 230,745 tons in Newfoundland, and 16,981 tons in Mexico, according to statistics compiled by the News Print Service Bureau. The Canadian output last year was 14 per cent more than in 1927, that in the United States 4.8 per cent less, in Newfoundland 20 per cent greater, and in Mexico 20 per cent more, making a total increase of 254,347 tons, or 6.7 per cent.

Production of newsprint in the United States in December was 115,049 tons and shipments from mills 115,033 tons, as against 123,785 tons produced and 122,880 tons shipped in the preceding month, while Canadian production was 208,484 tons and shipments 215,133 tons in December, compared with 223,645 tons made and 233,280 tons shipped in November. During December, 18,674 tons of newsprint were produced in Newfoundland and 1,724 tons in Mexico, so that the total North American output in that month amounted to 343,931 tons. Canadian mills operated at 84.3 per cent of rated capacity in December, and U. S. mills at 83.7 per cent. Stocks of newsprint paper at Canadian mills at the end of 1928 were 19,130 tons, and at United States mills 34,469 tons, making a combined total of 53,608 tons, which was equivalent to 3.5 days' average production.

Paper board production totaled 240,840 net tons in the United States during November, compared with 243,664 tons in the preceding month, mills producing at 83.6 per cent of their rated capacity in November, against 81.5 per cent in October, according to the monthly statistical summary compiled by the U. S. Department of Commerce. The total output of board in this country in the first eleven months of last year was 2,476,585 tons, against 2,289,096 tons in the same period of 1927. Mills had unfilled orders for 89,741 tons of board on hand at the end of November last, contrasted with 81,298 tons a month previously; shipped out a total of 237,341 tons of board during November, against 244,862 tons in October, and had stocks on hand amounting to 47,664 tons at the end of November, compared with 43,167 tons a month earlier.

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A GOOD reputation for dependable quality is always valuable to any business—to the Diamond Alkali Company it is a priceless asset—a reputation built up by years of unceasing vigilance in the manufacture of the highest quality Alkalies it is possible to produce.

Regardless of how you use Alkalies in your manufacturing processes, you can always specify Diamond Brand with the utmost confidence that its quality and uniformity will be constantly maintained.

Diamond Alkali Company

PITTSBURGH, PENNA.

Papermaking Rags

The demand for papermaking rags has shown some revival following the holiday and inventory season, and the market in certain of its branches is livelier decidedly. Moreover, there has been a strengthening of prices of those grades which are moving better, and this can be viewed as a reflection of the fairly firm statistical position of rags, and bears out the contentions of dealers that the supply condition in most classes of papermaking rags is such that all that is needed to carry market values upward is a little more buying on the part of consumers.

The increase in prices has involved chiefly new cotton cuttings. Paper mills have been more actively in evidence as buyers of some descriptions of new cuttings, and prices have advanced in relationship to the expansion of demand. There has also been a steadying of values of some old grades of rags, and although the market tone in such rags is much improved, no definite rise in prices of consequence has been recorded. The market—from a general standpoint—weathered the period of dullness during the holidays very well, with prices as a rule suffering no important downtrend, and now that consuming interest is better and paper manufacturers are buying in a larger way, there is a natural upward reaction occurring in values which appears likely to take the market to still higher levels before the momentum of market improvement has spent its full force.

In other words, this is the time of the year when collections of rags are about at their lowest. Out through the country, and even in the cities, inclement weather so hampers collectors that they are prevented from gathering the quantities of rags which reach the market at more favorable seasons, and also the production of new cuttings is at a low ebb because clothing manufacturing establishments are not now as busy as at other periods of the year. Thereby, dealers have the factor of supply to contend with, which makes them rather cautious about entering selling commitments, and market prices obviously are affected—a decidedly steadier, if not firmer, tone being noted. There is no scarcity nor shortage of rags; paper mills are covering their wants without apparent difficulty, and, furthermore, there are signs that considerable supplies of most grades of rags are available abroad and can be procured at slightly higher prices than now prevail in the market here, yet the supply situation is just bullish enough to wage an influence of a strengthening nature on values, as is the usual thing at around this time of the year.

Prices of new cuttings have stiffened to where dealers generally ask at least 7.25 cents a pound f.o.b. shipping points for blue overall cuttings, 8 cents for light silesias, 6 cents for fancy shirt cuttings, 4.75 cents for No. 1 washables, and 11 cents for new unbleached cuttings, and frequently above these figures is demanded. No. 1 white shirt cuttings have firmed in value to where 10.25 to 10.50 cents a pound usually is asked, though it is said that purchases are possible in some quarters at a bit under this basis. New canton flannel cuttings are firm, with dealers asking 9.75 cents for bleached and 8.75 cents for unbleached, and new soft black silesias are held at 4.50 cents or higher.

A fairly good movement of domestic roofing rags into consuming channels has been reported, and mills have paid 1.30 to 1.40 cents a pound f.o.b. dealers' shipping points for No. 2 stock or mixed satinets, and 1.60 to 1.70 cents for No. 1 packing or cloth strippings. Foreign roofing rags are quiet, and it is stated that about all that felt manufacturers will grant for dark colored cottons is 1.55 cents a pound ex dock New York. Old white cottons are wanted in routine quantities and are steady quotably at 5.50 cents upward per pound, depending on the quality of packing, for No. 1 repacked, and 2.50 to 3 cents for No. 2 repacked whites. Repacked thirds and blues are quoted at 2.25 to 2.50 cents a pound at shipping points, and twos and blues are bringing 2.50 to 2.75 cents.

Sales of imported new cuttings have been of moderate volume recently, but otherwise foreign rags are relatively neglected by paper manufacturers, who seemingly are filling their requirements mostly with domestic stock.

Average quotations f.o.b. shipping points and ex dock New York are as follows:

New Stock	New York and Chicago
White shirt cuttings, No. 1	10.00-10.50
White shirt cuttings, No. 2	6.50- 7.50
Fancy shirt cuttings	6.00- 6.25
Washables, No. 1	4.75- 5.00
Unbleached muslin	11.00-11.50
White lawns	9.00- 9.50
Overall cuttings, blue	7.25- 7.50
Black silesias	4.50- 4.75
Light flannelettes	8.25- 2.50
Canton flannels, bleached	9.75-10.00
Canton flannels, unbleached	8.75- 9.00
Shoe cuttings, bleached	7.50- 8.00
Shoe cuttings, unbleached	6.00- 6.50
Light silesias	8.00- 8.25
O. D. khaki cuttings	5.50- 5.75
Mixed khaki cuttings	4.75- 5.00
Corduroy cuttings	3.25- 3.50
Cottonade cuttings	3.25- 3.50
Linens, No. 1, white foreign	14.00-15.00
Light prints foreign	3.00- 3.25
Old Stock—	
Whites, No. 1 repacked	5.50- 6.50
Whites, No. 2, repacked	2.50- 3.00
Whites, house soiled	2.00- 2.25
Whites, street soiled	1.85- 2.00
Lace curtains	5.50- 5.75
Thirds and blues, rough	1.75- 1.90
Thirds and blues, repacked	2.25- 2.50
Black stockings	4.10- 4.25
Cotton canvas, No. 1	4.75- 5.00
White cotton batting	4.50- 4.75
Roofing, No. 1 (cloth strippings)	1.60- 1.70
Roofing, No. 2	1.30- 1.40
Linsey garments, foreign	1.75- 1.80
Dark colored cottons, foreign	1.55- 1.60
Blue linens, foreign	3.75- 4.00
Gray linens, foreign	4.00- 4.50
White linens, foreign	7.50- 8.00
Light prints, extra foreign	1.80- 2.00

Rope and Bagging

One of the firmest items in the papermaking raw material list at present is old rope. Demand for this article is fairly brisk; at any rate, it is evident that paper mills are absorbing all the supply of good quality old rope reaching the market, and are meeting firm prices. The supply condition, it is asserted, is all in favor of dealers. Collections of old rope simply are not measuring up to what formerly was considered normal tonnage, and, moreover, an important factor is that the grade of old rope now coming forward

"Superior" Rosin Size

In Tank Cars or Drums

SUPERIOR CHEMICAL
TRADE MARK

QUALITY STILL PAYS DIVIDENDS

The purchase of a really good cigar by one who enjoys his smokes is money well spent. So it is with everything else, whether it be a pair of shoes, a ton of coal or a tank car of "SUPERIOR" ROSIN SIZE.

The makers of SUPERIOR ROSIN SIZE are ever on guard to investigate and improve the quality and distribution of this product, in order that the paper mills in the United States, Canada, Great Britain and Continental Europe may be afforded the **highest quality Size delivered to them as economically and uniformly as possible.**

SUPERIOR ROSIN SIZE is truly the most used sizing agent today (here and abroad). It is constantly winning new friends and keeping them.

Paper Makers Chemical Corporation

Easton, Pa.	Kalamazoo, Mich.	Holyoke, Mass.	Albany, N. Y.
Atlanta, Ga.	Marrero, La.	Stoneham, Mass.	Carthage, N. Y.
No. Milwaukee, Wis.		Portland, Me.	Lockport, N. Y.
Savannah, Ga.	Jacksonville, Fla.	Boston, Mass.	Pensacola, Fla.

AND ASSOCIATES

C. K. Williams & Co., Easton, Pa., Emeryville, Cal., Malaga, Spain
Geo. S. Mepham & Company, East St. Louis, Ill.
Paper Makers Chemicals, Ltd., Erith, Kent, Eng.
Paper Makers Importing Co., Easton, Pa., St. Austell, Eng.
Vera Chemical Co. of Canada, Ltd., Freeman, Ont.

"There is a Superior Plant near you"

SUPERIOR PRODUCTS

Rosin Size
Wax and Special Waterproofings
Satin White
English and Domestic Clays
Casein
Casein Solvents
Foam Killers
Felt Soaps
Soap Powder
Vegetable Tallow
Anti-Froth Oil
Softeners
Colors Dry and Pulp

STANDARD-FLANGED-WOOD PIPE

Patent Applied for

Special Flange for Paper Mills.

ADVANTAGES:
Saves Power
No Discoloration
Lasting Qualities
Light in Weight
Cheaper.

A POWER SAVING PRODUCT (ask us about it)

Manufactured by

MICHIGAN PIPE COMPANY

Office and Factory: Bay City, Michigan

PRODUCTS:

Pipe for conveying—Pure Water, Acid Water, White Water, Sulphite Waste Water, Paper Stock, Ground Wood Pulp, Gases

SPECIAL FITTING FOR ACID WORK WRITE FOR CATALOG

Michigan Pipe for Paper Mills—Liquid Conveyed Touches No Metal

Showing the Special Flange Joint, Light in Weight, Specially Desired for Inside Installations. Easy to Take Apart

SERVICE:
We maintain experts who will take entire charge of pipe installations if desired.

OVER 100 PAPER MILLS ARE NOW USING STANDARD FLANGED WOOD PIPE INSIDE THEIR MILLS

HEAVY CHEMICALS

Pennsylvania Salt Mfg. Company

Executive Offices:
Widener Bldg., Philadelphia, Pa.

Representatives:
New York Chicago
Pittsburgh St. Louis

Works: Philadelphia and Natrona, Pa.
Wyandotte and Menominee, Mich.

RUSS GELATIN CO.

WORKS—WESTFIELD, MASS.

MANUFACTURERS OF

GELATIN and GLUE

ANIMAL SIZING GLUE STOCK

LARGEST SPECIALISTS IN AMERICA ON
FINE WRITING PAPER SIZING

E. F. RUSS COMPANY 287 Atlantic Avenue BOSTON, U. S. A.

from production and collection sources is not up to par, so that the supply of No. 1 old rope is further reduced. Mills are paying 4 cents a pound f.o.b. New York without seeming reluctance for No. 1 domestic old manila rope in sizable quantities, and doubtless this price has been exceeded in some cases, while foreign No. 1 old manila is fetching 3.50 to 3.75 cents a pound ex dock American Atlantic ports. In some instances it is said that consumers, being pinched for supplies, have granted prices which represent something of a premium for old rope. Strings are in fair demand and are quoted from 90 cents per hundred pounds upward at dealers' shipping points for mixed strings, according to quality.

Old bagging is comparatively quiet, but market rates are holding. No. 1 domestic scrap bagging is bringing 1.60 cents a pound f.o.b. shipping points, roofing bagging 1.25 cents, and No. 1 scrap wool tares around 1.55 cents. Old gunny bagging is quoted at about 1.65 cents a pound for No. 1 domestic, and 1.60 cents for imported gunny.

F.o.b. shipping point and ex dock New York quotations follow:

	New York and Chicago
Gunny, No. 1 domestic	1.60-1.70
Gunny, No. 1 foreign	1.50-1.60
Scrap bagging, No. 1	1.60-1.70
Roofing bagging	1.20-1.30
Wool tares, heavy	1.65-1.75
Wool tares, light	1.55-1.65
Manila rope, No. 1 foreign	3.50-3.75
Manila rope, No. 1 domestic	4.00-4.25
Sisal strings	1.50-1.75
Mixed strings	.90-1.10

Old Paper

After sinking to lower levels early in January, prices of old paper have acquired a firmer tone, and most grades now exhibit a rising trend, with some slight advancement recorded recently. The market is fairly active although it is apparent that board mills and other consumers are buying carefully and in the main to cover actual requirements. Supplies are ample, it would appear, but are not of sufficient weight to have weakening influence on market values; that is, not since demand from consuming quarters has broadened following the holiday lull.

White shavings are reported available down to 2.65 cents a pound for No. 1 hard white of some qualities, f.o.b. dealers' shipping points, and as low at 2.20 cents for soft white shavings, but these figures constitute about the bottom levels of the market and higher rates are quoted in most cases, particularly when better packing is concerned. High-grade hard white shavings are bringing 3 cents and more per pound, while extra quality soft white shavings are worth all of 2.60 cents a pound at shipping points. Old No. 1 mixed paper is selling in the East at 50 cents per hundred pounds f.o.b. New York, and folded news at 65 cents, but higher prices are prevailing in the Middle West. No. 1 heavy book stock is selling in New York at 1.55 cents per pound f.o.b. that city, ledger stock at 1.50 cents upward, depending on the packing, and No. 1 old kraft paper at around 1.85 cents.

The following are quotations named by dealers f.o.b. shipping points:

	New York and Chicago
Hard white shavings, No. 1	2.65-3.00
Hard white shavings, No. 2	2.50-2.75
Soft white shavings	2.20-2.60
Colored shavings	1.00-1.25
Heavy book, No. 1	1.50-1.60
Crumpled book, No. 1	1.25-1.35
Ledger stock	1.50-1.75
Kraft, No. 1	1.80-1.90
New kraft cuttings	2.40-2.60
Manilas, No. 1	.75- .85
Folded news	.65- .80
Sulphite mill wrappings	.75- .85

GDC

THE G D C POLICY

QUALITY FIRST

For the Coloring of Paper Specialties

We offer a full line of Dyes and also our services for application of same.

We solicit your inquiries.

NEKAL B EXTRA

An ideal wetting-out and softening agent for new and old press felts. An effective cleaning agent in place of sulphuric acid. Strictly neutral.

230 Fifth Avenue, New York, N. Y.

Boston Providence Philadelphia Charlotte Chicago San Francisco

GENERAL DYESTUFF CORPORATION

Starch—

A SIMPLE change in the manufacturing process often results in a pronounced decrease in cost of production.

Paper Mills use Starch for sizing to produce better and stronger sheets with lower cost of manufacture.

Our SPECIAL PAPER brand for beater-sizing increases strength of sheet and gives improved finish.

Our FOX HEAD brand for top-sizing is more economical than all glue-size.

CORN PRODUCTS REFINING COMPANY

17 Battery Place, New York City

Sulphur

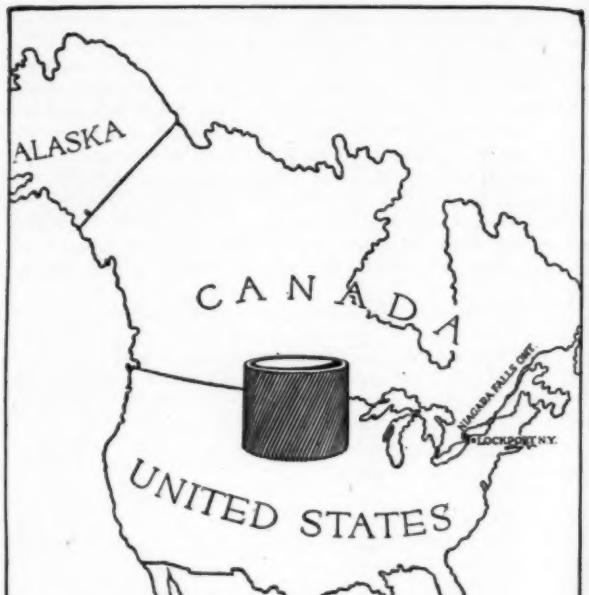
A FIRST REQUISITE

IN

Paper Making

Large Production
Ample Reserves
Prompt Deliveries
Purity 99½%

TEXAS GULF SULPHUR CO.
41 E. 42nd Street New York City
Mine Gulf, Matagorda County, Texas



F.W. ROBERTS MFG. CO. INC.
LOCKPORT N.Y. U.S.A.
F.W. ROBERTS MFG. CO.
OF CANADA LTD.
NIAGARA FALLS ONT.
MANUFACTURERS OF
PAPER & PULP MILL SPECIALTIES

Cut your cost of Production
Improve your Quality
Increase your Profits

by

The use of Efficient Equipment

for

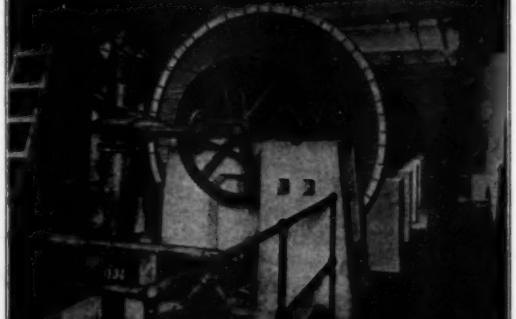
1. Woodpreparing
2. Acidmaking
3. Cooking
4. Screening
5. Dewatering
6. Drying

We cover the whole field

G. D. Jenssen Co.

200 Fifth Ave., New York City

Sole Representatives
For: Paper Machinery, Ltd.
Montreal, Quebec



Paper Mill Tanks

The above installation in a well-known Ohio paper mill is only one of Hauser-Stander's successful installations.

Hauser-Stander has been building tanks for over fifty years and has particular knowledge of paper mill men's requirements.

The Hauser-Stander Tank Co.
CINCINNATI, OHIO

Old corrugated boxes	.65- .75
New corrugated box cuttings	.80- .90
Mixed paper, No. 1	.50- .65
Common paper	.40- .50

Pulpwood

The market for pulpwood is showing greater activity, and consumers are reported drawing on supplies from cutting sources. A report from New Brunswick says that pulp mills in both Maine and New Brunswick are absorbing material from that province, and that contractors are busy filling the demand, and more activity is noted in the market than in some time. The general tone of the market is more optimistic, and the 1929 peeling season is expected to be better.

Exports of pulpwood from Canada in 1928, all of which came to the United States, totaled 1,532,266 cords, valued at $16,269,660, showing a decline in tonnage but an increase in value over the 1,541,769 cords of a value of $15,702,705 exported in 1927.

Mechanical Pulp

There is fair market activity in mechanical pulp. Consumers are absorbing supplies in moderately good tonnage, and an especially pleasing feature at present is that buyers are manifesting increased interest in spot shipments, which is taken to mean that consumers are proceeding with comparatively small stocks and therefore are obliged to look for prompt deliveries in some cases. The price tone is firmer than it has been in a long while. Grinders are not pressing matters—not by any means—instead they are adopting just an opposite attitude, of permitting buyers to come to them in search of supplies, and then refusing to accept orders unless obtaining a price which nets them at least a reasonable amount of profit. Also, the cold weather in many grinding regions is a helpful market factor because producers are unable to grind at full tilt, so that the present output of ground wood is considerably curtailed.

Grinders in Canada are quoting about $27 a ton f.o.b. pulp plants for prime spruce ground wood, freshly ground, for prompt shipment, while imported ground wood of Scandinavian origin is around a quotable basis of $33 a ton ex dock New York or other American Atlantic ports for dry pulp. Domestic ground wood is nominally $28 a ton f.o.b. grinding mills.

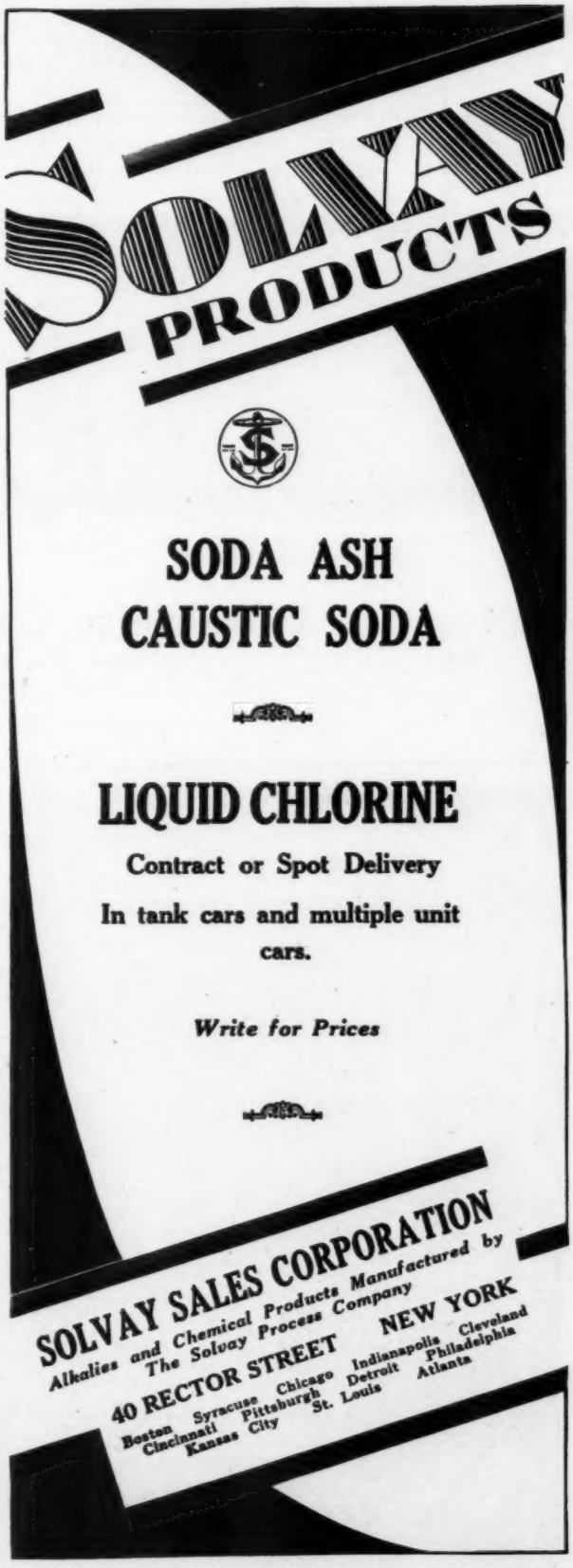
During November, mills in the United States produced a total of 96,258 tons of ground wood, against 85,513 tons in October, while stocks at production plants at the end of November aggregated 78,538 tons, compared with 76,818 tons a month previously.

Chemical Pulp

Business in chemical wood pulp of domestic make is developing in a fairly consistent manner and is aggregating moderately heavy volume, so reports state. Consumers are taking supplies readily against contracts, and there is sufficient spot demand to be creative of fair activity in the open market. Prices are holding about stationary, with the tendency, if anything, in an upward direction and with those on the selling side of the market expressing the belief that values will be maintained fully during the remainder of the winter if not longer.

The most popular grades of bleached sulphite are selling at 4 cents a pound or thereabouts f.o.b. pulp mills, with the full range of quotations from 3.75 to 4.75 cents, according to quality. Strong unbleached sulphite is quoted at 2.75 to 3 cents a pound at producing points for book grades, and 2.50 to 2.75 cents for newsprint sulphite. Bleached soda pulp is steady at 3 cents to a little higher at pulp mills, and No. 1 domestic kraft is quoted from 2.75 to 3 cents per pound by eastern mills.

Production of chemical pulp in the United States in November last amounted to 123,513 net tons, compared with 128,834 tons produced in the preceding month, according to the American Paper and Pulp Association. Stocks at producing mills at the end of November totaled 24,211 tons of



Here's how silicate can help you!

PAPER mills use silicate of soda for many things. Silicate hops right into the job at the pulp digester. "U" Brand silicate is an ingredient of the acidproof cement lining of the digester. Then for bleaching, it has been found that by adding silicate, bleach could be saved and a whiter pulp obtained. Have you a copy of the pamphlet "Soluble Silicates, Their Influence on Hypochlorite Bleach"?

Effect of Silicate with Calcium Hypochlorite Bleach on sheets of Sulphite Pulp.

Of course, every wise paper maker uses "A-Syrup" or "S" Brand silicate in the beater—it increases the strength, and improves the finish and the color. To thin the clay for coating, silicate again gives the best results. The last operation in the mill is the capping of the paper rolls. Send for information on how "Seal" Brand silicate speeds up shipping and reduces your glue costs.

Philadelphia Quartz Company

General Offices: Philadelphia
Chicago Office: 205 W. Wacker Dr.
Seven Plants and Stocks in 42 Cities

Uncle Jake Says~

"So long as we are content to remain in the steerage, cabin passengers are sure of their berths."

If we had been content with our
KVP Papers
we would not have been interested in making them better and more suitable for your needs.

KALAMAZOO VEGETABLE PARCHMENT CO.
KALAMAZOO, MICHIGAN

New Papers

Writing—	
White rag	15–40
White sulphite	9–30
Colored rag	15–40
Colored sulphite	8–30
Ledger—	
White rag	16–40
White sulphite	9–30
Colored sulphite	8–30
Colored rag	15–40
Bonds—	
White rag	16–40
White sulphite	7–30
Colored sulphite	7–30
Colored rag	15–40
Books—	
No. 1 S. & S. C.	5.75– 8.00
Machine finished	5.50– 8.00
English fiinish	5.50– 8.00
Coated and enameled	7.50–13.00
Lithograph, M. F.	7.50–14.00
Newsprint—	
Rolls, contract	2.75–
Rolls, transient	3.00– 3.25
Sheets	3.25– 3.50
Side runs	2.75– 3.00
Cover stock—	
Coated, both sides	–10.25
Coated, one side	–10.15
Tissue—	
No. 1 white, 20x30	.75– .90
No. 2 white, 24x36	.75– .90
No. 1 Manila, 24x36	.70– .80
Kraft	.90– 1.00
Wrapping—	
No. 1 kraft	5.50– 6.00
No. 2 kraft	4.25– 4.75
Southern kraft	4.25– 4.50
Boards—	New York and Chicago
Solid news	35.00–40.00
Straw	52.50–57.50
Plain chip	30.00–35.00
White coated chip	45.00–50.00
Manila coated chip	40.00–45.00
Binder's board	65.00–70.00

Chemical Pulp

(*Continued from page* 2037)

all grades of chemical, against 23,111 tons at the end of October.

Quotations f.o.b. pulp mills are as follows:

Bleached sulphite	3.75-4.75
Easy bleaching sulphite	2.75-3.00
Unbleached sulphite, No. 1 strong (news grade)	2.50-2.75
Unbleached sulphite, No. 1 book	2.75-3.00
Soda pulp, bleached	3.00-3.25
Mitscherlich, unbleached	3.00-3.25
Kraft, No. 1	2.75-3.00
Screenings, refined	1.40-1.60

Chemicals

Demand for papermaking chemicals is reported fair, and there is a consistent movement on contracts as well as against spot orders. Quotations show little or no change while holding their own on stabilized levels. Average quotations are as follows:

Alum, lump ammonia	3.50 - 3.75
Alum, lump starch	3.75 - 4.00
Blanc fixe, powder	3.50 - 3.75
Bleaching powder	2.00 - 2.35
Brimstone (long ton, at mine)	18.00 -20.00
Casein (duty paid)	14.50 -15.50
Caustic soda, spot delivery	2.90 - 3.00
China clay, domestic washed	8.00 -10.00
China clay, foreign	15.00 -20.00
Rosin, Grade E	9.40 - 9.60
Satin white	2.00 - 2.25
Soda ash, 50 per cent light (bags)	1.32½- ....
Starch, papermakers', in bags	3.67 - .,..
Talc (ton)	16.00 -18.00

Market Quotations

Issued by H. D. Knox & Co., 44 Broad St., New York

The quotations mentioned below are more or less nominal in some cases owing to the inactivity of the securities, but we invite inquiries on these and other allied industries' securities and we will endeavor to furnish actual markets.

BONDS	Bid	Asked
Abitibi Fibre Co. 6s, 1941	104	
Abitibi Power & Paper 5s, 1953	87	87½
American Sales Book 6s, 1939	102½	104
Advance Bag & Paper 6s, 1952	94	97
Bastrop Pulp & Paper 6s, 1940	104½	
Beaver Produce 7½s	109	111
Bedford Pulp & Paper 6s, 1942	98	100
Belgo Canadian Paper 6s, 1943	101	102
British Columbia Pulp & Paper 6s	88	91
Brompton Pulp & Paper 6s, 1935	103	
Brush Moore Paper 6s, 1937	99¾	
Bryant Paper Co. 6s, 1942	100	101
Celotex Co. 6s, 1936		96
Canada Paperboard Co. 7s, 1937	100	103
Central Paper Co. 6½s, 1941	86	87
Central Paper Co. 6s, 1933	87	89
Central Paper Co. 7s	87	
Champion Fibre 6s, 1941	99	100
Champion Coated Paper 6s	102	
Columbia River Paper Mills 6s	98	
Defiance Paper Co. 6s, 1939	97	99
Dells Paper & Pulp 6s, 1939	95	98
Donnaconna Paper Co. 5½s, 1948	92	94
Eastern Mfg. Co. 7s, 1938	100½	101½
Escanaba Paper Co. 6s, 1939	98	100
Filer Fibre 7s, 1937	94	97
Fitchburg Paper 5s, 1929	99	
Glatfelter Paper 6s, 1938	94	96
Hawley Pulp & Paper 6s, 1946	97	
Hoberg Paper & Fibre 7s, 1937	94½	96
Industrial Fibre Co. 8s	100	102
Itasca Paper Co. 6s	99	
Itasca Paper & Prairie River 5½s	100	
Jessup & Moore Paper 6s, 1945		70
Kalamazoo Vegetable Parchment 6s, 1938	98	
Manitoba Paper Co. 6s	103	105
Mead Fibre Co. 7s, 1937	100	
Munising Paper 6s, 1936	98	
Marathon Paper Co. 5½s, 1942	99	
Marinette & Menominee Paper Co. 7½s	102½	103½
Mead Pulp & Paper Co. 5s	95½	
Mengel Company 7s, 1934	104	
Minnesota & Ontario Paper Co. 6s	88	90
Missisquoi Pulp & Paper Co. 7s, 1929	96	
Missisquoi Pulp & Paper Co. 6s	95	
Monroe Paper Products Co. 7½s	97	99
Murray Bay Paper Co. 6½s	103½	
Oswego Falls Paper Co. 6s, 1941	98	100
Orono Pulp & Paper Co. 6s, 1943	102	
Orono Pulp & Paper Co. 6s, 1941	97	
Parker Young Co. 6½s, 1944	100	102
Paper & Textile Machinery Co. 7s	100	103
Patterson Parchment Paper 6s, 1938	100	101
Peerless Paper Co. 6s	98	100
Penobscot Chemical Fibre 6s, 1942	102	104

(*Continued on page* 2047)

J. ANDERSEN & CO.

21 East 40th Street New York City

Importers of Chemical Pulps
BLEACHED AND UNBLEACHED

Agents for Kellner Partington Paper Pulp Co., Ltd.
Sarpsborg, Norway; Forshaga, and Edsvalla, Sweden

The Pulp and Paper Trading Co.

21 East 40th Street New York City

Dealers in Domestic Chemical and Mechanical Pulps and Paper

AGENTS FOR
J. & J. ROGERS COMPANY, Ausable Forks, N. Y.
E. B. EDDY COMPANY, LTD., Hull, Canada
CANADIAN KRAFT LIMITED, Three Rivers, Canada
Dealers in Wayagamack Kraft Pulp
Howard Smith Paper Mills, Montreal, Quebec.
EASTERN AGENTS of Sulphite Pulp
Made by Port Huron Sulphite & Paper Co., Port Huron, Mich.

Bathurst Power & Paper Company, Limited

PRICE & PIERCE, LTD.

17 East 42nd Street, NEW YORK CITY

ARE NOW THE

SELLING AGENTS
for Bathurst Pulp in the United States

Unbleached Sulphite 50 tons daily
Kraft Pulp 50 tons daily

Our pulp is made from Canadian Spruce
We ship in Sheets, baled

BATHURST, NEW BRUNSWICK, CANADA

The B Co. INC. QUALITY PULPS

HAFSLUND NORWAY — **"HAFSLUND BEAR" Bleached Sulphite**

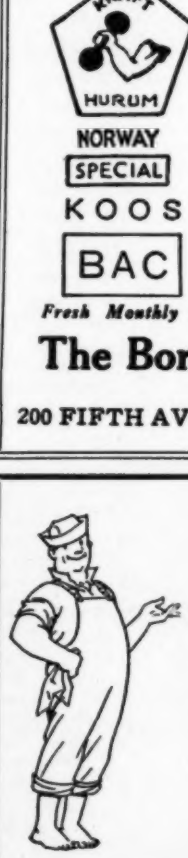
F:HAGA — **"FORSHAGA" Bleached Sulphite**

KRAFT HURUM — **"HURUM SPECIAL" Extra Strong Kraft**

NORWAY SPECIAL KOOS BAC — **"BAMBLE" Extra Strong Kraft**

Fresh Monthly Shipments—No Closed Winter Season

The Borregaard Company
Incorporated
200 FIFTH AVENUE NEW YORK, N. Y.



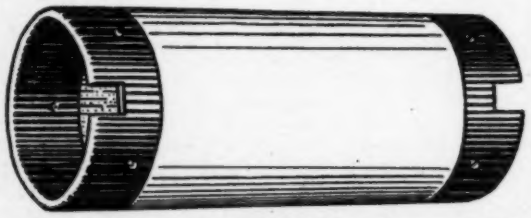
Ham Feltz says:

"These here paper machines is like operie primi donnas—touchy as all get out. But one way to keep 'em from acting up is to slip on a Hamilton Felt—takes out more water than squeezin' a sponge, and makes the boss happy by cutting down on the coal bill. Why not—the guys what makes 'em 've got 70 years of 'knowin' how' to help 'em."

Hamilton Felts

ELIXMAN PAPER CORE CO., INC.

Corinth, N. Y. U. S. A.



CANADIAN ELIXMAN CO., LTD.
Hamilton, Ont. Canada

EXPORTS

Exports of paper from the United States in November recorded a fair gain in point of value over the preceding month and also over the corresponding period of 1927, according to official statistics compiled and issued by the U. S. Department of Commerce in Washington. During November exports of all kinds of finished paper and board from this country reached a total value of $2,885,976, against $2,707,479 in October last year, and $2,346,389 in November, 1927. The November exports brought the total for the first eleven months of 1928 up to an aggregate value of $28,235,434, showing a fair rate of increase over the exportations valued at $24,714,306 in the similar time of 1927.

Exports of newsprint paper in November last amounted to 2,863,269 pounds, valued at $106,066, compared with 2,660,536 pounds of a value of $100,385 in the preceding month, and 1,693,039 pounds of a value of $82,653 in November the year before. On the other hand, the value of total newsprint exports in the first eleven months of 1928—reaching $813,672—was below the value of $1,125,938 of exports in the same period of 1927.

Wrapping paper exports in November last totaled 3,743,718 pounds, valued at $257,634, against a value of $221,986 in the preceding month, and $210,905 in the same month of 1927. Book paper, not coated, exports in November were 2,131,757 pounds of a value of $147,339, showing an increase over the 1,938,507 pounds of a value of $147,504 exported in the preceding month, and 1,135,014 pounds of a value of $97,976 in November, 1927. Writing paper exportations climbed from a value of $231,475 in October last to $338,640 in November, and tissue paper exports were valued at $79,324 in November, against $89,180 in the preceding month.

Box board exports declined from a total value of $145,652 in October last to $83,595 in November, while exports of other paper board and strawboard were valued at $154,304 in November, against $164,516 in the preceding month.

IMPORTS

Wood Pulp

It is generally agreed by importers and agents in New York City that buyers of chemical wood pulp are proceeding rather cautiously in adding to their commitments for forward supplies of pulp, and that most of the purchasing recently has been of a more or less routine character and scope. Those brands of pulp which paper manufacturers are accustomed to use in a regular way have been contracted for fairly freely for forward shipment from abroad, but otherwise it would appear as if consumers are permitting their other requirements to go somewhat uncovered, presumably being of the opinion that there is no reason for them to feel that they will experience and difficulty in buying when more in need of supplies later in the year.

Despite the comparatively quiet condition of the market, it can be said that the statistical position of chemical wood pulp is firm—very much so. It probably is not going too far to state that technically the market is stronger than it has been in long while. American paper mills have contracted for fair amounts of pulp for this year's shipments from abroad, and consumers in England and elsewhere in Europe have bought quite freely for sometime of late, so that the mills in Scandinavia are well sold ahead. In fact, reports from authoritative sources say they are better sold up than they ordinarily are this early in the year, which is likely to prove an important factor in the maintenance of market prices over the next few months.

Quotations are marked by a steady tone, and prices seem to have become fully established on levels where buyers are finding it very difficult to break through. Possibly most of the business now being consummated other than as regards spot lots of pulp, is close to the lower edge of quotational ranges, but sellers are holding out for at least certain rates and are not disposed to reduce these figures any further. Strong sulphite is quoted at 2.55 to 2.65 cents a pound ex dock American Atlantic ports for prime quality, with extra grades priced up around 2.70 cents, while prime bleached sulphite is firm on a range of 3.85 to 4.40 cents ex dock, depending on quality, with the most popular grades selling at 3.90 to 4 cents. Prime easy bleaching sulphite is selling around 2.80 cents a pound on the dock, and prime Swedish kraft pulp at 2.50 to 2.60 cents. Imported groundwood of Scandinavian origin is quoted at $32 to $33 per short ton ex dock New York or other seaboard points for dry pulp.

Imports of chemical wood pulp into the United States in November last were on a fairly large scale, totaling 113,205 long tons of all grades of chemical, valued at $6,728,635, as compared with 133,136 tons of a value of $7,673,193 in the preceding month, and 128,664 tons of a value of $7,595,180 in the corresponding month of 1927. The November imports brought the total for the first eleven months of last year up to 1,187,551 tons, giving a monthly average of 107,959 tons, and showing an increase of about 4,000 tons per month over the monthly average of 103,983 tons imported in the similar period of 1927. Imports of groundwood in November were 17,524 long tons, valued at $427,227, contrasted with 21,325 tons of a value of $539,571 imported in the preceding month, and 25,275 tons in November, 1927. Groundwood imports in the first eleven months of last year totaled 198,239 tons, valued at $4,858,221, against 196,985 tons of a value of $5,405,663 in the same time of 1927.

Current market quotations ex dock New York, and receipts at the port of New York during January, 1929, follow:

Bleached sulphite, No. 1	3.85– 4.25
Unbleached sulphite, strong No. 1	2.55– 2.75
Unbleached sulphite, No. 2	2.35– 2.55
Easy bleaching sulphite	2.75– 3.00
Mitscherlich unbleached, genuine	3.00– 3.25
Mitscherlich unbleached, ordinary	2.60– 2.75
Kraft, standard Swedish	2.50– 2.70
Ground wood, per ton (dry)	32.00–33.00

Price & Pierce, 1,500 bls. from Gothenburg, 600 Soderhamn and 3,600 Wallvik; O. E. Klaer, 875 bls. from Greaker; Irving Trust Co., 1,040 bls. from Hamburg, 4,920 Hernosand and 900 Bremen; J. Andersen & Co., 3,410 bls. from Greaker, 13,200 Hernosand, 125 Soderhamn, 1,770 Sarpsborg and 1,000 Bremen; Chemical National and 1,125 Hamburg; Pagel, Horton & Co., 3,750 bls. from Gefle; Bank, 360 bls. from Tofte and 650 Iggesund; E. M. Sergeant Co., 1,659 bls. from Gothenburg and 470 Oslo; W. A. Harriman & Co., 1,523 bls. from Gothenburg; M. Gottesman & Co., 660 bls. from Rotterdam, 450 Soraker, 500 Iggesund and 3,600 Sebenico; Castle & Overton, 9,812 bls. from Hamburg, 930 Rotterdam and 150 Sundsvall; Bulklay, Dunton & Co., 7,380 bls. from Hernosand, 6,975 Soderhamn, 2,500 Sundsvall, 750 Gefle, 2,500 Bremen, 1,050 Iggesund and 1,125 Hamburg; Pagel, Horton & Co., 3,750 bls. from Gefle; E. J. Keller Co., 1,180 bls. from Hamburg and 800 Oslo; Central National Bank, 1,200 bls. from Stockholm; Scandinavian Pulp Agency, 7,540 bls. from Skutskar and 8,750 Wifstavarf; Johaneson, Wales & Sparre, 1,800 bls. from Soraker, 1,025 Sundsvall and 299 Gothenburg; Atterbury Bros., 3,250 bls. from Oslo; Perkins-Goodwin Co., 500 bls. from Sundsvall; Farmers Loan & Trust Co., 800 bls. from Oslo; Order, 750 bls. from Greaker, 1,332 Hamburg, 4,837 Viborg, 10,235 Kotka, 4,485 Raumo, 1,344 Helsingfors, 575 Folkis, 657 Bremen and 13,500 Hernosand.

Paper Stock

Importations of papermaking rags into the United States during the first eleven months of 1928, according to official U. S. Department of Commerce statistics, showed a consider-

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Conveyor or Gravity Feed Shredder

Give Beaters a Lift

The MITTS & MERRILL SHREDDER through it's economical method of preparing stock for the beater contributes much to the completion of the beater's work in the shortest possible time, thereby cutting down operating costs and speeding up the process of paper making.

MITTS & MERRILL SHREDDERS are built in sizes with spouts ranging from 18" to 45" wide. We will be glad to quote you on any size adapted to your requirements.

It gives the beater an economical lift.

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We also build a 100% efficient "Hog" to reduce pulp mill bark and wood refuse

See pages 364 and 365 in the 1928 Paper and Pulp Mill Catalogue

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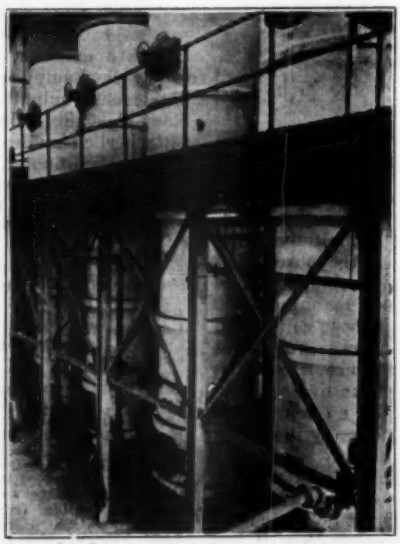

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SODA and
SULPHATE
PROCESSES

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See page 314 in the 1928 Paper and Pulp Mill Catalogue

able increase over the preceding year, totaling 407,140,353 pounds of a value of $7,501,224, against 351,832,186 pounds of a value of $7,027,219 imported in the similar period of 1927. Imports of waste bagging and waste paper in the same time amounted to 136,824,384 pounds last year, contrasted with 97,348,557 pounds in 1927, while imports of old rope and other paper stock were 62,117,597 pounds, against 59,377,986 pounds in 1927.

Imports of papermaking materials in January were fairly heavy, judging from unofficial figures thus far available. Arrivals of all grades of paper stock excepting wood pulp at the port of New York last month, these data being taken from manifests of steamers reaching that port during the month, were as follows:

Old Rope—William Steck & Co., 231 coils and 98 bls.; Brown Bros. & Co., 592 bls. and 612 coils; Ellerman's Wilson Line, 191 coils; United Fruit Co., 5 bls.; Chase National Bank, 240 bls.; Irving Trust Co., 98 bls.; International Purchasing Co., 326 coils; N. E. Berzen, 47 coils; W. Schall & Co., 134 bls.; Bank of the Manhattan Co., 8 bls.; R. Canoval & Sons, 94 bls.; E. J. Keller Co., 51 bls.; Order, 168 bls.

Old Bagging—Katzenstein & Keene, 630 bls.; Chase National Bank, 106 bls.; Johns-Manville Corp., 48 bls.; W. Schall & Co., 431 bls.; A. W. Fenton, Inc., 78 bls.; International By-Products Co., 163 bls.; Interstate Trust Co., 71 bls.; Banca Commerciale Italiana Trust Co., 130 bls.; Salomon Bros. & Co., 200 bls.; Bank of the Manhattan Co., 150 bls.; Gallagher & Ascher, 25 bls.; E. J. Keller Co., 266 bls.; Order, 556 bls.

Rags—Darmstadt, Scott & Courtney, 274 bls.; H. Burrows, 63 bls.; Robert Blank, 35 bls.; J. Cohen & Son Co., 123 bls.; Salomon Bros. & Co., 121 bls.; Ernst Mayer, 101 bls.; J. Reiss & Co., 4 bls.; E. Butterworth & Co., 28 bls.; Albany Fibre Co., 4 bls.; S. Birkenstein & Sons, 156 bls.; American Rag Trading Co., 122 bls.; Charles Belsky Co., 63 bls.; Katzenstein & Keene, 353 bls.; S. Shapiro & Co., 40 bls.; N. S. Maloof & Co., 25 bls.; Atlas Waste Mfg. Co., 37 bls.; Victor Galaup, Inc., 159 bls.; E. A. Stone Co., 34 bls.; Royal Mfg. Co., 31 bls.; Castle & Overton, 25 bls.; American Wool Stock Co., 50 bls.; E. J. Keller Co., 676 bls.; Corn Exchange Bank, 48 bls.; Maryland Waste Co., 67 bls.; Atlantic Forwarding Co., 8 bls.; Amtorg Trading Corp., 89 bls.; State Bank, 113 bls.; Bankers Trust Co., 39 bls.; Equitable Trust Co., 361 bls.; Bank of the Manhattan Co., 575 bls.; Bank of United States, 10 bls.; Grace National Bank, 31 bls.; National City Bank, 334 bls.; Chase National Bank, 3,862 bls.; Irving Trust Co., 24 bls.; Manufacturers Trust Co., 17 bls.; Interstate Trust Co., 155 bls.; National Bank of Commerce, 105 bls.; Union Bank & Trust Co., 271 bls.; Fidelity Trust Co., 168 bls.; Guaranty Trust Co., 10 bls.; Imperial Municipal Bank & Trust Co., 21 bls.; American Express Co., 116 bls.; Brown Bros. & Co., 114 bls.; Goldman, Sachs & Co., 54 bls.; P. J. Schweitzer, 42 bls.; Barrett Co., 133 bls.; A. W. Fenton, Inc., 340 bls.; D. C. Andrews & Co., 11 bls.; Amsinck, Sonne & Co., 113 bls.; C. R. Spence & Co., 84 bls.; Goschens & Cunliffe, 40 bls.; Van Oppen & Co., 59 bls.; W. Schall & Co., 290 bls.; Order, 2,917 bls.

Miscellaneous Paper Stock—Castle & Overton, 133 bls.; Darmstadt, Scott & Courtney, 373 bls.; Alfred Bloch & Co., 105 bls.; Whaling Waste Products Co., 158 bls.; William Steck & Co., 242 bls.; J. Cohen & Sons Co., 128 bls.; American Wool Stock Co., 25 bls.; David Galloway, Inc., 48 bls.; E. J. Keller Co., 333 bls.; Bank of the Manhattan Co., 18 bls.; Anglo-South American Trust Co., 396 bls.; Chase National Bank, 989 bls.; National Bank of the United States, 38 bls.; National Bank & Trust Co., 12 bls.; Manufacturers Trust Co., 12 bls.; National Bank of Commerce, 124 bls.; National City Bank, 29 bls.; Barrett Co., 59 bls.; Milton Snedeker Corp., 232 bls., Brown Bros. & Co., 93 bls.; Amtorg Trading Corp., 4 bls.; A. W. Fenton, Inc., 51 bls.; Furness, Withy & Co., 123 bls.; R. F. Downing & Co., 39 bls.; Amsinck, Sonne & Co., 83 bls.; Order, 896 bls.

Paper

Imports of paper into the United States in November last were valued at $14,147,560, showing a little decline from the imports of a value of $14,370,483 in the preceding month, according to U. S. Department of Commerce statistics. Imports in the first eleven months of last year scored an appreciable gain in point of value, however, totaling $141,926,254, as compared with importations of a declared value of $136,093,480 during the corresponding period of 1927.

Imports of paper in January, 1929, were fairly large, judging from receipts through the port of New York. Arrivals of all kinds of paper at that port last month, these data being taken from manifests of steamers reaching New York during the month, were as follows:

Printing—Keuffel & Esser Co., 140 rolls from Hamburg and 17 cs. Havre; Ossian Ray, 94 reels and 11 bls. from Gothenburg; Hudson Trading Co., 350 reels from Gothenburg and 99 rolls Oslo; C. Steiner, 27 cs. from Rotterdam; Perkins-Goodwin Co., 1,181 reels from Hamburg; E. Dietzgen & Co., 112 cs. from Rotterdam; Bank of Montreal, 22,479 rolls from Corner Brook; J. J. Bernitz, 154 bls. from Hamburg; H. Reeve Angel & Co., 769 reels from Kotka; Hoboken Trust Co., 6 cs. from Bremen; Gallagher & Ascher, 26 cs. from Bremen; Walker, Goulard, Plehn Co., 241 cs. from Bremen; F. Henjes, Jr., 66 reels from Hamburg; Martin & Bechtold, 13 cs. from Bremen; P. C. Zuhlke, 13 cs. from Antwerp; Order, 1,780 reels and 290 bls. from Hamburg, 2,127 reels and 137 cs. Bremen, and 13 cs. Havre.

Wrapping—C. Steiner, 31 bls. from Hamburg; E. Dietzgen & Co., 101 cs. from Rotterdam; Fidelity Trust Co., 55 rolls from Bremen; Universal Carloading & Distributing Co., 3 cs. from Bremen

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Croceine Scarlet FP Conc.

ESPECIALLY recommended for dyeing chemical pulps in the beater.—Possesses excellent fastness to light.—Does not foam, and leaves a nearly colorless "white-water".

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Experience in Making Dryer Felts

FITCHBURG Cotton Dryer Felts have conformed to the highest standards of quality and workmanship for over eighty years. This is one reason why today they are used so extensively.

¶ Manufactured in English weave, two, three, four, five and six ply, from 60 to 288 inches in width.

¶ Fine faced felts for fine papers. For coarse papers, use "Triune" three-ply Felts —**they're dependable.**

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and 10 cs. Rotterdam; C. K. MacAlpine & Co., 205 bls. from Gothenburg; Chemical National Bank, 41 rolls from Gothenburg; Birn & Wachenheim 214 cs. from Antwerp; Standard Products Corp., 8 cs. from Antwerp; Walker, Goulard, Plehn Co., 18 bls. from Hamburg; F. C. Strype, 7 cs. from Antwerp; J. E. Bernard & Co., 31 bls. from Antwerp; S. A. Lux, 13 cs. from Antwerp; Atlantic Forwarding Co., 18 cs. from Hamburg; H. A. Astlett & Co., 30 bls. from Para; J. H. Schroeder Banking Corp., 30 cs. from Hamburg; Furness, Withy & Co., 5 bls. from Corner Brook; Arkell Safety Bag Co., 250 reels from Gothenburg; Crepe Kraft Co., 71 reels from Gothenburg; Borregaard Co., 1,706 reels from Gothenburg; Thomas Barrett & Son, 22 bls. from Gothenburg; Order, 65 bls. from Gothenburg and 24 cs. Antwerp.

Cigarette—DeManduit Paper Corp., 408 cs. from Havre and 422 cs. St. Nazaire; Standard Products Corp., 499 cs. from Havre; British-American Tobacco Co., 234 cs. from Southampton; American Tobacco Co., 832 cs. from Bordeaux; M. Spiegel & Sons, 38 bls. from Genoa; Dollar Steamship Line, 51 cs. from Marseilles; P. J. Schweitzer, Inc., 267 cs. from Marseilles; Ivars & Cacasin, 5 cs. from Alicante; Southern Pacific Co., 3 cs. from Havre; P. Lorillard Co., 60 cs. from Liverpool; Order, 2 cs. from Havre.

Writing—Coenca-Morrison Co., 16 cs. from Havre; Guibont Freres & Co., 6 cs. from Southampton; Globe Shipping Co., 5 cs. from Southampton.

Drawing—Keuffel & Esser Co., 4 cs. from Southampton, 192 cs. Hamburg, 19 cs. Rotterdam and 3 cs. Havre; Favor, Ruhl & Co., 5 cs. from London and 2 cs. Havre; International Forwarding Co., 17 cs. from Antwerp; H. Reeve Angel & Co., 6 cs. from London; G. Haas, 6 cs. from London.

Filter—H. Reeve Angel & Co., 109 cs. from Southampton and 49 cs. London; C. Sleicher & Schuil Co., 15 cs. from Hamburg; Lazard Frers, 2 cs. from Marseilles; J. Manheimer, 15 bls. from Bremen and 45 bls. Southampton; A. Giese & Son, 4cs. from Hamburg.

Tissue—D. C. Andrews & Co., 3 cs. from Liverpool; Schenkers, Inc., 217 cs. from Hamburg; F. B. Vandegrift & Co., 10 cs. from Liverpool; Dodwell & Co., 2 cs. from Kobe; Order, 23 cs. from Hamburg.

Hanging—F. J. Emmerich & Co., 3 bls. from Southampton, 51 cs. Hamburg, 88 bls. Liverpool and 2 cs. Havre; C. A. Haynes & Co., 11 bls. from London and 12 bls. Liverpool; A. C. Dodman, Jr., Inc., 63 bls. from Liverpool, 2 cs. Havre, 33 bls. Southampton and 35 bls. Bremen; W. H. S. Lloyd & Co., 3 bls. from Hamburg and 9 bls. London; Prager Co., 37 bls. from Antwerp; F. A. Binder, 105 bls. from Bremen; Stern, Stiner & Co., 11 bls. from Hamburg; Irving Trust Co., 112 cs. from Hamburg; C. G. Hampton & Co., 4 bls. from Liverpool; Universal Carloading & Distributing Co., 10 cs. from Bremen; Schmidt, Prichard & Co., 4 bls. from Hamburg; Wedemann, Godknecht & Lally, 6 bls. from Hamburg; R. F. Downing & Co., 32 pkgs. from London; Globe Shipping Co., 62 bls. from Hamburg; G. J. Hunken & Co., 2 bls. from Bremen; J. E. Bernard & Co., 9 cs. from Bremen and 8 cs. Hamburg; Order, 3 bls. from Bremen and 2 bls. London.

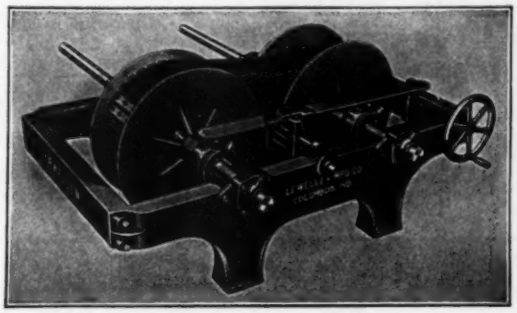
Photo—J. H. Schroeder Banking Corp., 228 cs. from Bremen and 25 cs. Hamburg; Globe Shipping Co., 294 cs. from Bremen; J. J. Gavin & Co., 6 cs. from Liverpool; J. E. Bernard & Co., 26 bls. from Antwerp; Gevaert Co. of America, 176 cs. from Antwerp; P. C. Zuhlke, 223 cs. from Antwerp; American Express Co., 52 cs. from Antwerp; P. Puttmann, 47 cs. from Antwerp; Order, 7 cs. from Hamburg.

Board—Lagerloef Trading Co., 528 bls. from Hamburg and 175 bls. Rotterdam; C. K. MacAlpine & Co., 27 bls. from Gothenburg; Adrian Vuyck, 298 reels from Rotterdam; A. B. Massa Paper Corp., 200 pkgs. from Rotterdam; Hygrade Eagle Corrugated Paper Corp., 171 reels from Rotterdam; Bourjois, Inc., 15 cs. from Havre; Perkins-Goodwin Co., 196 rolls from Rotterdam; Coty, Inc., 167 cs. from Havre; H. H. Ayer, Inc., 4 cs. from Havre; D'Orsay Perfumery Co., 38 cs. from Havre.

Miscellaneous—S. Gilbert, 173 cs. from Bremen; Japan Paper Co., 4 bls. from Gothenburg, 17 cs. Havre and 3 cs. London; D. C. Andrews & Co., 8 cs. from Havre; Hensel, Bruckman & Lorbacher, 10 bls. from Havre, 21 cs. Bremen and 5 cs. Hamburg; Boulin Co., 34 cs. from Havre; C. Bruning, 21 rolls from Rotterdam; J. Herschel & Co., 15 cs. from Hamburg; Central Union Trust Co., 76 cs. from Hamburg; Meadows, Wye & Co., 10 cs. from Glasgow; Hurley-Johnson Corp., 68 bls. from Liverpool; Gallagher & Ascher, 2 cs. from London; P. H. Petry & Co., 9 cs. from Rotterdam; J. Beckhardt & Co., 3 cs. from Rotterdam; Heemsoth & Basse, 21 bls. from Rotterdam; Kennedy & Co., 5 cs. from Rotterdam; Judson Freight Forwarding Co., 28 cs. from Hamburg; Globe Shipping Co., 6 cs. from Havre, 95 cs. Rotterdam and 35 bls. Hamburg; Hudson Forwarding & Shipping Co., 3 cs. from Antwerp; International Forwarding Co., 43 cs. from Rotterdam and 5 cs. Hamburg; Dyson Shipping Co., 4 cs. from Havre; Universal Carloading & Distributing Co., 5 cs. from Havre and 16 cs. Bremen; Agasote Millboard Co., 883 rolls from Corner Brook; Borden & Riley Paper Co., 14 cs. from Antwerp; B. F. Drakenfeld & Co., 45 cs. from Liverpool; Keller-Dorian Paper Co., 147 cs. from Havre; Whitefield Paper Works, 25 cs. from Kobe; Ault & Wilborg, 5 cs. from Canton; Whiting-Patterson Co., 7 cs. from Rotterdam; Consumers Paper Corp., 7 bls. from Rotterdam; Van Oppen & Co., 4 bls. from Hamburg; F. Murray Hill, Inc., 19 cs. from Bremen; Marcus Ward Co., 31 cs. from Bremen; J. J. Shore & Co., 8 cs. from Bremen; G. W. Sheldon & Co., 11 cs. from London and 2 cs. Havre; Tamm & Co., 4 cs. from Trieste and 9 cs. Bremen; H. Reeve Angel & Co., 5 cs. from Yokohama; W. J. Byrnes & Co., 2 cs. from Havre; Quality Art Novelty Co., 51 cs. from Hamburg and 4 cs. Havre; E. M. Sergeant Co., 6 cs. from Gothenburg; Public National Bank, 36 cs. from Marseilles; Phoenix Shipping Co., 4 cs. from Bremen; Atlantic Forwarding Co., 25 cs. from Hamburg; American Express Co., 67 cs. from Hamburg and 8 cs. Antwerp; Titan Shipping Co., 3 cs. from Havre; Bernard Ullman Co., 14 reels and 19 cs. from Gothenburg; F. L. Kraemer & Co., 8 cs. from London; Irving Trust Co., 70 cs. from Havre; F. A. Flinn & Co., 3 cs. from Havre; R. F. Downing & Co., 13 cs. from Havre; Stern, Stiner & Co., 10 cs. from Havre; Stern Bros., 8 cs. from Havre.

The Detroit office of the General Refractories Company has been moved to 6-230 General Motors Building. This office will continue to be in charge of J. L. Graham.

LEWELLEN Variable Speed TRANSMISSION



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TRY THEM! You'll never go back to ordinary steel knives once you do. Bolton Bronze and Stainless Knives are a proved success. Every mill that has tried them out is adopting them as standard.
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Market Quotations

(*Continued from page 2039*)

Queen City Paper Co. 7s	97½	
Riordan Pulp & Paper Co. 6s, 1942	102	
River Raisin Paper Co. 6s, 1936	98½	101½
Rolland Paper Co. 6s, 1937	101	103
St. Regis Paper Co. 6s, 1931	100	101
St. Annes Paper Co. 6½s, 1953	103	105
St. Croix Paper Co. 5s, 1928	95	
St. Helena Pulp & Paper 6s, 1941	99	
St. Lawrence Pulp & Lumber Co. 6s	10	15
Spruce Falls Power & Paper 5½s	98	100
Stevens & Thompson Paper 6s, 1942	95	97
Southern Advance Bag & Paper 6s, 1947	90	94
Smith (Howard) Paper Co. 6½s, 1941	103	
Smith (Howard) Paper Co. 5½s, 1953	94	96
Taggert Bros. 6s, 1941	95	100
Tait Paper & Color Industries 6s	90	94
Ticonderoga Pulp & Paper 6s, 1940	100	102
Ticonderoga Pulp & Paper 5s, 1930	96	98
Tonawanda Paper Company 5½s	99½	101
United Wall Paper 6s, 1947	96	98
Watab Paper Co. 6½s, 1942	102½	104
Whitaker Paper Co. 7s, 1938	108	109
Warren (S. D.) 6s, 1945	104	105
Westfield River Paper Co. 7s	88	90
Wm. Whitmer Parsons Pulp & Lumber Cons. 8s	18	22
Waterway Paper Products 6s	101	

STOCKS

American News Company	OW	
American Book Common	122	127
American Sales Book Common	134	136
American Sales Book Preferred	140	
Androscoggin Pulp Co. Common	30	
Androscoggin Pulp Co. Preferred	90	
Brown Co. Preferred	95	97
Bryant Paper Co. Common	7	10
Belgo Canadian Paper Co. Preferred	95	97
British Columbia Pulp & Paper Common	6½	8
British Columbia Pulp & Paper Preferred	69	73
Canada Paperboard Co. Preferred	90	94
Champion Fibre Preferred	105	
Champion Coated Paper Co. Preferred	105	107
Chemical Paper Co. 1st Preferred	90	
De Jonge (Louis) & Co. Preferred	95½	96½
Dryden Paper Co. Preferred	38	41
Diem & Wing Preferred	92	95
Downington Paper Co. Preferred	103	
Downington Paper Co. Common	93	
Eddy Paper Co. Common	30	
Escanaba Paper Co. "B" Preferred	42	
Escanaba Paper Co. Common	3	
Glatfelter Paper Common	101	
Great Northern Paper Co. Common	60	63
Gair (Robt.) Co. Preferred	34	36
Gair (Robt.) Co. Common	10	13
Hawley Paper Co. Preferred	96	
Hammermill Paper Co. Preferred	96	
Holyoke Card & Paper Co. Preferred	170	
Hinde & Dausch Paper Co. Preferred	101	103
Hinde & Dausch Paper Co. Common	25	28
International Pulp Co. Preferred	75	78
International Textbook Co.	17	18
Jessup & Moore Paper 1st Preferred	27	31
Jessup & Moore Paper Common	4	10
Keyes Fibre Co. Class "A" Common	43	5
Marathon Paper Mills Common	125	
Marathon Paper Mills Preferred	170	
Mead Pulp & Paper Common	68	72
Minnesota & Ontario Paper Pfd.	68	72
Missisquoi Pulp & Paper Pfd.	90	95
Munising Paper Co. Common	33	
Munising Paper Co. Preferred	83	87
Northern Paper Mills	30	32
National Paper & Type Pfd.	78	80
Orono Pulp & Paper Common	40	45
Oglesby Paper Co. Preferred	101	
Occident Paper Co. Preferred		105
Oxford Paper Co. Preferred	108	109
Oxford Paper Co. Common	193	
Parker Young Co. Preferred	87	
Parker Young Co. Common	27	31
Package Paper & Supply Units	25	
Penobscot Chemical & Fibre Common	80	
Robertson Paper Co. Preferred	5	
Robertson Paper Co. Common	50c	
Rogers Paper Co. Common	45	50
River Raisin Paper Co.	7	9
St. Regis Paper Pfd.	106	108
St. Croix Paper Co. Common	168	
Sutherland Paper Co.	22	25
Tait Paper & Color Industries Preferred	OW	BW
Tait Paper & Color Industries Common	65	
United Wall Paper Preferred	90	95
United Paperboard Preferred	63	
West Virginia Pulp & Paper Preferred	100	102
West Virginia Pulp & Paper Common	50	53
West Virginia Timber Preferred	90	94
Westfield River Paper Co. Preferred	85	95

Felt Cleanliness

THE **Cleanliness** of your **Felts** is an important part of your paper making. Dirty felts give you trouble and greatly increase your cost by necessitating frequent shut-downs for felt changes and washing.

A **Felt Washer** which will clean the felt while it is running will greatly increase the efficiency of your plant. The Lansing Felt Washer will do that.

The **Felt** will be **kept soft.**

The **Life** of the **Felt** will be **Increased.**

The **Quality** of the **Sheet** will be **improved.**

Greater Production will result as the necessity of shutting down for felt washing will be practically eliminated.

The washing is done in nature's own way, with plain water.

Representative mills all over the country are now using this washer with satisfactory results.

May we tell you more about it?

GILBERT J. SCOFIELD COMPANY, INC.

683 Broadway

ALBANY, N. Y.

BUILT FOR HARD WORK, LONG LIFE, AND NO WORRY TO THE OWNER

ZAREMBA
EVAPORATORS

HAVE ESTABLISHED AN ENVIABLE REPUT ATION

IN THE CONCENTRATION OF

SODA BLACK LIQUOR SULPHATE BLACK LIQUOR
SULPHITE WASTE LIQUOR

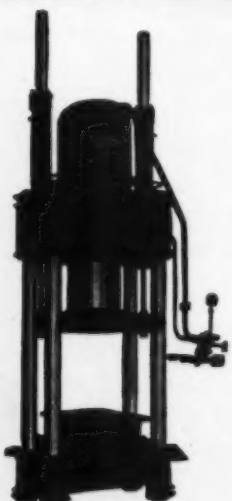
DUE TO
WIDE EXPERIENCE—THOROUGH ENGINEERING—PAINSTAKING CONSTRUCTION

ZAREMBA COMPANY
506 Crosby Bldg., Buffalo, N. Y.

New York City Office: 95 Liberty St.

SOUTHWARK

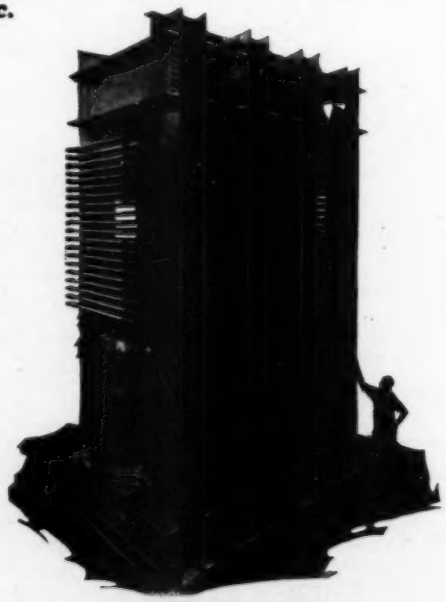
Hydraulic Equipment for Pulp and Paper Mills, Wall Board Plants, Etc.



600 Ton Pulp Press

PULP PRESSES
BALING PRESSES
WALL BOARD PRESSES
PULP TRUCKS
HYDRAULIC PUMPS
ACCUMULATORS
VALVES, FITTINGS, ETC.

Southwark Hydraulic Equipment is the choice of the largest and best known Pulp and Paper Mills throughout the country. They find Southwark products give the most efficient service under exacting conditions. Write for Bulletin No. 14.



2000-ton 12'-6"x4'-6" 20 Opening Wall Board Press

SOUTHWARK
FOUNDRY and MACHINE CO.
400 WASHINGTON AVENUE
PHILADELPHIA, PA.

343 S. DEARBORN ST.
CHICAGO

AKRON
100 E. SOUTH ST.

Foreign Trade Opportunities

The following foreign trade opportunities are issued by the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce. Those interested are requested to communicate with the Bureau at its offices in Washington or New York or its branch offices in other cities, in every case mentioning the number of the inquiries referred to.

No. 35265—Overissue newspapers. Tientsin, China. Purchase desired.

No. 35390—Paper. Bombay, India. Agency and purchase desired.

No. 35319—Overissue newspapers. Amritsar, India. Agency and purchase desired.

No. 35410—Wallpaper. Milan, Italy. Agency desired.

No. 35379—Wood fiber and wall board. Wellington, New Zealand. Agency desired.

No. 35395—Writing paper. Madrid, Spain, Agency desired.

No. 35377—Wrapping paper, kraft, and fourfold kraft brown sacks for cement. Hull, England. Agency desired.

No. 35382—Wrapping paper and paper bags. San Juan, Porto Rico. Agency desired.

No. 35474—Building and roofing paper. Winnipeg, Canada. Purchase and agency desired.

No. 35475—Vulcanized fiber for trunks. Warsaw, Poland. Purchase desired.

No. 35586—Board, composition. Bogota, Colombia. Agency desired.

No. 35585—Building paper, cheap; and wallboard. Wellington, New Zealand. Agency desired.

No. 35581—Paper and pulp manufacturing machinery. Vienna, Austria. Agency desired.

No. 35760—Board, container. Christchurch, New Zealand. Agency desired.

No. 35759—Cardboard for calendars. Buenos Aires, Argentina. Purchase desired.

No. 35761—Print paper, white and colored; bank and bond papers, imitation art and real art papers, and cream laid and wove writing papers. Wellington, New Zealand. Agency desired.

No. 35749—Wood pulp, chemical and mechanical. Milan, Italy. Agency desired.

No. 35762—Writing, bond and ledger papers. Milan, Italy. Agency desired.

No. 35698—Caustic soda. Batavia, Java. Agency desired.

No. 35705—Caustic soda. Messina, Italy. Agency desired.

Alaska Has Vast Pulpwood Resources

That Southeastern Alaska can become a great permanent papermaking region is the opinion of the Forest Service, United States Department of Agriculture. Vast forests of pulpwood in the Tongass National Forest are to be managed by the Government for a never-ending production of timber. With excellent water power resources, tidewater transportation, and a climate that will permit yearlong plant operation and shipping, say the government foresters, the region is a natural locale for a paper industry; and its future holds the possibilities of model industrial towns, modern plants, and a stable population of mill and woods workers.

Under forestry management, it is estimated, Southeastern Alaska's forests can produce a million and a half cords of pulpwood, enough for a million tons of newsprint, annually in perpetuity. This is more than one-fourth of the present yearly consumption of newsprint in the United States.

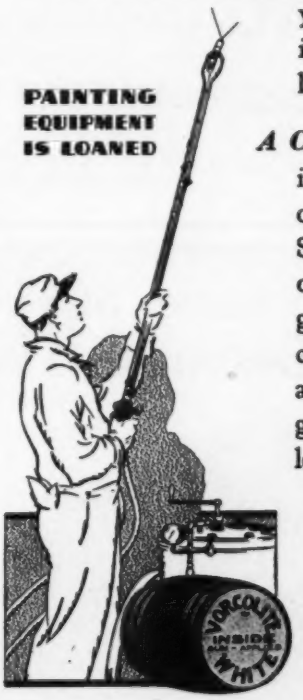
Samuel M. Langston Company, Camden, N. J., announces that H. C. Mayhew, sales representative, with headquarters formerly at Camden, has been transferred to Pittsburgh, Pa., from which point he will handle western Pennsylvania, Ohio, western New York, West Virginia and Kentucky, with occasional trips into Canada. H. S. Harwood of Appleton, Wis., has also become identified with Samuel M. Langston Co., and will devote his efforts exclusively to the paper and board mills, primarily in the middle west, with headquarters for the present at Appleton.

No One Can Paint Better Than You . . . *Yourselves!*

Three Vortex Features Put You in Full Command of Your Own Painting Program

As Fine a Paint as any obtainable, Vorcolite is the *one* full bodied, highly pigmented oil paint that is specially compounded for mechanical application; the one paint that covers effectively with one coat.

A Specialized Equipment, developed by us and far surpassing an ordinary paint gun for large area work is furnished without cost as long as you need it. It cuts painting costs to the absolute minimum.



A Complete Painting Plan is furnished on request by one of our Large Area Specialists, who will go over your plant and suggest how to organize your crew, where to start, and how to proceed for greatest economy and least interruption of your regular work. Use coupon for request.

THE VORTEX MANUFACTURING CO.
1981 West 77th Street
Cleveland, Ohio

the VORTEX PAINTING METHOD

THE VORTEX MANUFACTURING CO.
1981 West 77th Street • Cleveland, Ohio

We are considering an ☐ inside ☐ outside job to do approximately _____ sq. ft. Send your large area specialist to look it over and to tell us how to handle it from start to finish in the most practical and least costly way.

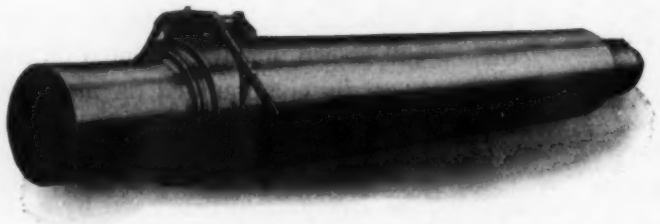
Company _____

Address _____

Attention _____ V-28

FARREL

FARREL INDICATING ROLL CALIPER



Farrel Indicating Roll Caliper mounted on Farrel 30" x 184" roll

With this new caliper rolls may be calipered to the end of face without reversing the instrument. Only two adjustments are necessary in changing from one diameter roll to another. The majority of the parts are made of aluminum alloy making the caliper very light and easily handled but very sturdy. Extremely accurate.

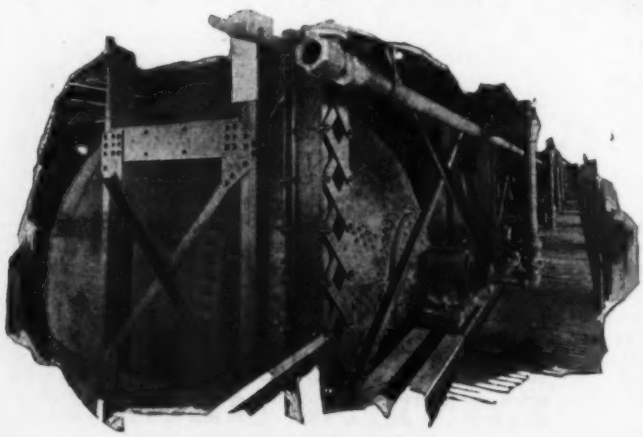
Send for circular describing this caliper.

FARREL ROLLS are made as large as 298" ON THE FACE

FARREL-BIRMINGHAM COMPANY INC.
ANSONIA, CONN.

Successor to: { Farrel Foundry & Machine Co., Ansonia, Conn., Est. 1848.
{ Birmingham Iron Foundry, Derby, Conn., Est. 1836.

You Can Leave Steel Plate Fabrication to Us
Because That's Our Job



The Improved Biggs Rotary

Your big job is to produce paper in bigger volume, or better quality, or both. Ours is to supply you with the most practical equipment you can use.

Accuracy, prompt service and reasonable costs are yours when you deal with Biggs, because fabricating standard and special steel plate equipment such as Rotaries, Digesters, Penstocks, Stacks, Tanks, etc., for the Paper and allied industries, has been our business for over 40 years.

Our interesting literature is yours on request.

Why not write for it today?

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STEEL PLATE WORK